Queensland **the Smart State**

# Fisheries Long Term Monitoring Program

## Summary of stout whiting (*Sillago robusta*) survey results: 1991–2006

October 2007

Queensland Government
Department of Primary Industries and Fisheries

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Sandra O'Sullivan

Eddie Jebreen

Department of Primary Industries and Fisheries

Queensland

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**General disclaimer:**

The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

This publication has been compiled by Fisheries, Assessment and Monitoring.

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# Contents



# Acronyms

| | |
|---|---|
| DPI&F | Department of Primary Industries and Fisheries, Queensland |
| IAPE | index of average percentage error |
| GSI | gonadosomatic indices |
| LTMP | Long Term Monitoring Program, DPI&F |
| TACT | Total Allowable Catch Table |
| T1 | Queensland East Coast Trawl Fishery |
| T4 | Queensland Finfish (Stout Whiting) Trawl Fishery |

# Summary

In Queensland, stout whiting (*Sillago robusta*) is targeted by the Finfish (Stout Whiting) Trawl Fishery (T4), which is a demersal otter trawl fishery. Although also caught by the T1 otter trawl sector of the Queensland East Coast Trawl Fishery, they can not be retained. Stout whiting is also a commercial species caught by the New South Wales Trawl Fishery.

The monitoring aims to provide a long-term data series of size and age structure representative of fish caught in the T4 fishery. These data feed into regular assessments of the fishery that are used to set an annual voluntary quota. This quota system has become part of the evidence allowing export approval to be granted under the Australian Government's *Environment Protection and Biodiversity Conservation Act (1999)*. In 2006, the quota was set at 1200 t.

This report presents results of the 16 years of data available (1991 to 2006). Across all these years, stout whiting ranged from 70 to 245 mm in fork length and from 3.17 to 129.4 g in total weight. Age groups ranged from 0+ to 8+ years.

# Long Term Monitoring Program background

The Department of Primary Industries and Fisheries (DPI&F), Queensland, manages the state's fish, mollusc and crustacean species and their habitats. As part of this commitment, DPI&F monitors the condition of, and trends in, fish populations and their associated habitats. This information is used to assess the effectiveness of fisheries management strategies and helps ensure that the fisheries remain ecologically sustainable.

DPI&F uses the information to demonstrate that Queensland's fisheries comply with national sustainability guidelines, allowing exemption from export restrictions under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999*.

DPI&F initiated a statewide Long Term Monitoring Program (LTMP) in 1999, in response to a need for enhanced data used in assessment of Queensland's fisheries resources. The LTMP is managed centrally by a steering committee, with operational aspects of the program managed regionally from the Southern and Northern Fisheries Centres located at Deception Bay and Cairns respectively. The regional teams are responsible for organising and undertaking the collection of data used for monitoring key commercial and recreational species, and for preparing data summaries and preliminary resource assessments.

A series of stock assessment workshops in 1998 identified the species to include in the LTMP. The workshops used several criteria to evaluate suitability, including:

- the need for stock assessment
- the suitability of existing datasets
- the existence of agreed indicators of resource status
- the practical capacity to collect suitable data.

Resources monitored in the program include saucer scallops, spanner crabs, stout whiting, yellowfin bream, sand whiting, dusky flathead, rocky reef fish, eastern king prawns, blue swimmer crabs, sea mullet and tailor in southern Queensland; tiger and endeavour prawns and coral trout and redthroat emperor in northern Queensland; and mud crabs, barramundi, spotted and Spanish mackerel and freshwater fish in both regions. Various sampling methods are used to study each species.

The LTMP collects data for resource assessment (ranging from analyses of trends in stock abundance indices to more complex, quantitative stock assessments) and management strategy evaluations.

Stock assessment models have already been developed for saucer scallops, spanner crabs, stout whiting, mullet, tailor, barramundi, tiger and endeavour prawns, redthroat emperor, and spotted and Spanish mackerel. In some cases, management strategy evaluations have also been completed and the data collected in the LTMP proved integral to these activities.

The assessments and evaluations have allowed for improvements to the management of Queensland's fisheries resources. Enhancements to ongoing monitoring have also been identified, particularly to address the increasing demand for high quality data for dynamic fish population models.

Through the ongoing process of collecting and analysing LTMP data, incorporating these data into regular assessments, and refining monitoring protocols as required, DPI&F is enhancing its capacity to ensure that Queensland's fisheries resources are managed on a sustainable basis.

# Introduction

In Queensland the stout whiting (*Sillago robusta*) catch is predominantly taken by commercial fishers. This species' distribution extends from Fremantle northward to Shark Bay (western population) and from Bustard Head in southern Queensland to Coffs Harbour, New South Wales (eastern population) (McKay 1992). The eastern population appears to constitute a single stock (Ovenden and Butcher 1999). The distribution of the eastern population of stout whiting overlaps with the northern New South Wales population of red spot whiting, also known as eastern school whiting (*Sillago bassensis flindersi*). Stout whiting occurs in bays but is principally an oceanic species, attaining a maximum length of 280 mm (McKay 1992).

The Australian east coast stout whiting population is caught by three separate commercial trawl fishery sectors. They are:

- The Queensland Finfish (Stout Whiting) Trawl Fishery, which is a demersal otter trawl fishery (T4 sector). Stout whiting are the principal target species of this sector.
- The T1 sector of the Queensland East Coast Trawl Fishery, which captures stout whiting incidentally from Sandy Cape (north Fraser Island) to the Queensland – New South Wales border. Stout whiting is currently regulated as a not permitted species under the Fisheries (East Coast Trawl) Management Plan 1999 and as such is discarded by this sector.
- The New South Wales Trawl Fishery, which operates from the Queensland – New South Wales border to the New South Wales – Victorian border and retains a mixed catch of stout and red spot whiting.

Between November 2003 and March 2004, DPI&F undertook a pilot observer program that collected estimates of permitted and not permitted species from the T1 fishery, including stout whiting (McGilvray 2004). The magnitude of the bycatch from the T1 trawl was previously unknown. McGilvray (2004) presents data on stout whiting catches by otter trawlers operating in the T1 sector.

The stout whiting fishery began in 1981 off the south coast of Queensland and consisted of one operator targeting red spot whiting. The fishery changed to target stout whiting after evidence suggested that a commercial market existed for this species. In 1984, stout whiting also began to be taken as bycatch and sold by prawn trawlers. However the market demand was low because this product did not satisfy market demands. At this time, Thailand also entered the market with a similar but lower priced product. Subsequently, participation in the Queensland fishery was reduced back to a single operator, who retained market share by upgrading equipment and fishing practices specifically to produce a high quality stout whiting product.

The fishery expanded between 1989 and 1990, with 11 boats reporting catches. The 1991 restructuring of the fishery changed it to a limited entry developmental trawl fishery, restricted to a managed area between 20 fathoms and 50 fathoms between Caloundra and Sandy Cape. In the same year a market collapse resulted in large volumes of stout whiting being unsold, and subsequently the fishing effort reduced. The licensing structure was further refined to form a specific endorsement (T4) for the stout whiting trawl fishery (*Fisheries Act 1994*). Four operators currently hold the five licenses available under the T4 endorsement.
This fishery operates from 1 April to 31 December each year, excluding the period of the southern trawl closure (20 September to 1 November) (Fisheries (East Coast Trawl) Management Plan 1999). Since 1999, an industry-agreed Total Allowable Commercial

Catch (TACC) had been set annually, based on a DPI&F stock assessment. This voluntary annual quota is divided equally among the five operators (O'Neill *et al.* 2002). The quota for 2006 was set at 1200 t.

A new framework was used for setting the 2007 quota. The Total Allowable Catch Table (TACT) is a system that can estimate the annual quota in response to changes in standardised catch rates and catch-at-age frequencies. In 2007 using the TACT, the quota increased 50 t to 1250 t (M. O'Neill, pers. comm., February 2007).

The stout whiting fishery is currently approved as a Wildlife Trade Operation, assessed as meeting guidelines under the *Environment Protection and Biodiversity Conservation Act (1999)* requirements, and is allowed to export its catch. Stout whiting is sold principally for on-processing in Thailand, China, Vietnam, Japan or Taiwan for the Japanese *kisu-hiraki* style (butterfly) fillet market for use as finger-food. Some product is re-exported from Asia to local Australian markets (O'Neill *et al.* 2002). In 2006, the landings of stout whiting were 936 t (CFISH database, February 2007).

In addition to stout whiting, T4 licensed fishers can apply for a General Fisheries Permit to retain quantities of pinkies (*Nemipterus* spp.), whiptails (*Pentapodus* spp.), goatfishes (*Mullidae* spp.), yellowtail scad (*Trachurus* spp.), squid, cuttlefish (*Sepia* spp.), octopus (*Octopus* spp.), Balmain bugs (*Ibacus* spp.) and Moreton Bay bugs (*Thenus* spp.).

Monitoring of the stout whiting catch has occurred since 1991 and is currently the responsibility of the DPI&F LTMP.

# Objectives

The DPI&F LTMP aims to collect data that are representative of the stout whiting fishery. The data collected from the commercial catch are:

- length structure
- weight of individual fish
- age structure.

# Methods

Methods are described in detail in the sampling protocol for this species (DPI&F 2007a). All samples collected are ungraded to eliminate any sampling bias. Fishers provide the following trip information with each sample:

- vessel name
- date
- total number of cartons per shot
- start and end locations and start and end times of shots.

Age was estimated using the protocols described in DPI&F (2007b).

## Sites

The fishery area, known as the T4 fishery area, is the area between the 20 and 50 fathom (36 and 90 m) depth contours from Sandy Cape (24°42′ S, 153°15′ E) to Caloundra (26°40′ S, 153°8′ E) (Fisheries Regulation 1995) (Figure 1).

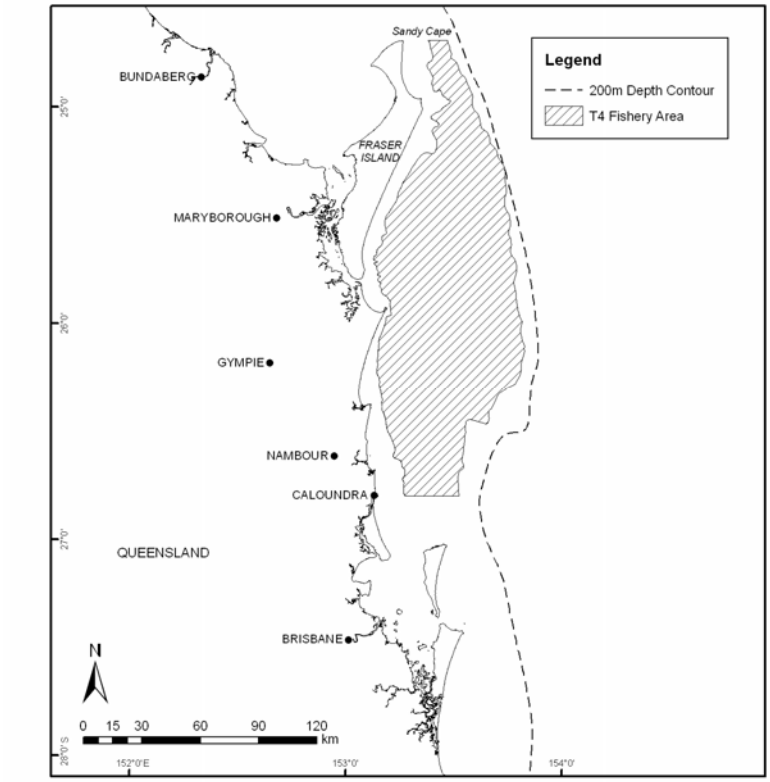


**Figure 1. Stout whiting T4 managed area from Caloundra to Sandy Cape.**

## Times

The fishery operates from 1 April to 31 December each year, excluding the period of the southern trawl closure (T4 operators voluntarily do not fish during the southern trawl closure). All vessels provide two 5 kg boxes of ungraded fish from each trip. One box is from a night trawl shot and one box is from a daylight shot.

## Gear

The T4 fishery employs otter trawl methods, where single multi-filament nets pass over the seabed to harvest stout whiting. Nets are restricted to a total length of 88 m, a sweep length of 128 m and a mesh size between 38 and 60 mm (Fisheries Regulation 1995).

## Data summaries and analysis

### Length frequency

Length frequencies were weighted according the amount of catch taken by each vessel and were plotted for all years.

### Length–weight

A length–weight relationship (fork length versus total body weight) was generated using all data.

### Gonadosomatic indices (GSI)

From 1991 to 2004, temporal trends in reproductive status were investigated by calculating gonadosomatic indices (GSI). The spawning period was from September to December, with a peak for both sexes in October (O'Sullivan *et al*. 2005).

### Assignment of age group

Otolith increment counts were converted to age group on the basis of period of opaque zone formation, edge classification, and date of capture of the fish. Opaque zone formation was seen to occur across the months of October to February (O'Sullivan *et al*. 2005). A nominated birth date of 1 January was assigned as assessment is based on calendar year. An age group allocation matrix was constructed to assign probable age groups to each fish (Table 1).

**Table 1. Age group allocation matrix for stout whiting, based on capture month, number of increments observed, and edge classification. Nominated birth date is 1 January.**

| Month sampled | New edge (≥ 1 increment) | Intermediate edge (≥ 1 increment) | Wide edge (≥ 1 increment) |
|---|---|---|---|
| January | Increment | Increment | Increment +1 |
| February | Increment | Increment | Increment +1 |
| March | Increment | Increment | Increment +1 |
| April | Increment | Increment | Increment |
| May | Increment | Increment | Increment |
| June | Increment | Increment | Increment |
| July | Increment | Increment | Increment |
| August | Increment | Increment | Increment |
| September | Increment –1 | Increment | Increment |
| October | Increment –1 | Increment | Increment |
| November | Increment –1 | Increment | Increment |
| December | Increment –1 | Increment | Increment |

### Age frequency

Age frequencies were weighted according to the annual catch of each vessel.

### Growth curve

A growth curve of length at age (decimal age) was fitted with a von Bertalanffy growth function using only the 1993 and 1994 samples collected twice each month during a stratified research survey, carried out in depths of 10, 20 and 30 fathoms (Butcher and Brown 1995).

The von Bertalanffy growth function was calculated as:

$$L_t = L_\infty \left(1 - e^{-k(t-t_0)}\right)$$

where $L_t$ is length at time $t$, $L_\infty$ is the asymptotic length, $k$ is the growth coefficient, $t$ is the time, and $t_0$ is the theoretical age at zero length. The growth parameters were estimated by a least squares procedure using Solver routine in Microsoft Excel®.

From the growth curve, lengths of stout whiting were adjusted, for use in the age–length keys, to the middle of the fishing season (July), as this was when most fish were sampled.

### Age–length keys

Age–length keys were constructed for each year, using adjusted lengths and ages. These keys reflect the annual age structure by size class.

### Data limitations

In interpreting the results in this report, the following factors need to be considered:

- As the sampling is concentrated on the commercial sector, the results characterise the fish retained by fishers and may not truly represent the population because of a combination of fish and fisher behaviour. This may impact on the results because of targeting, fishing location, gear selectivity and quota.
- Sample collection was during a specified time period and factors such as moon/tide phase, weather conditions or other environmental factors may have varied. Data have not been standardised to account for any effect these factors may have had on the catch.
- Results have been standardised, but it should be noted that sample sizes varied between years, regions and boats.
- In 2004, changes to the quality control and quality assurance procedures employed during age estimation were made. These included:
    - the reference collection use and composition
    - reader qualification, and bias and precision testing.
- In 2006 a rigorous fish ageing protocol (DPI&F 2007b) was implemented.
- As age data were not available for 1991 and 1992, the length at age data for 1993 and 1994 were pooled (combined) to produce an age–length key to be used for 1991 and 1992.

# Results and discussion

Stout whiting ranged from 70 to 245 mm in fork length (Figure 2). A length–weight relationship is presented in Figure 3. Age groups ranged from 0+ to 8+ years (Figure 4). In 2005 and 2006, the otolith reader trained and qualified before reading the current sample (Appendix A). A growth curve was plotted using data from 1993 and 1994 combined (Figure 5). The von Bertalanffy growth parameters were estimated as $L_\infty = 224$ mm, $k = 0.45$ and $t_0 = -1.08$ years. Age–length keys show the annual age structure and further show the distribution by size class for each year (Appendix B - Age–length keys).

These data are used to set the T4 stout whiting quota.

## Length frequency

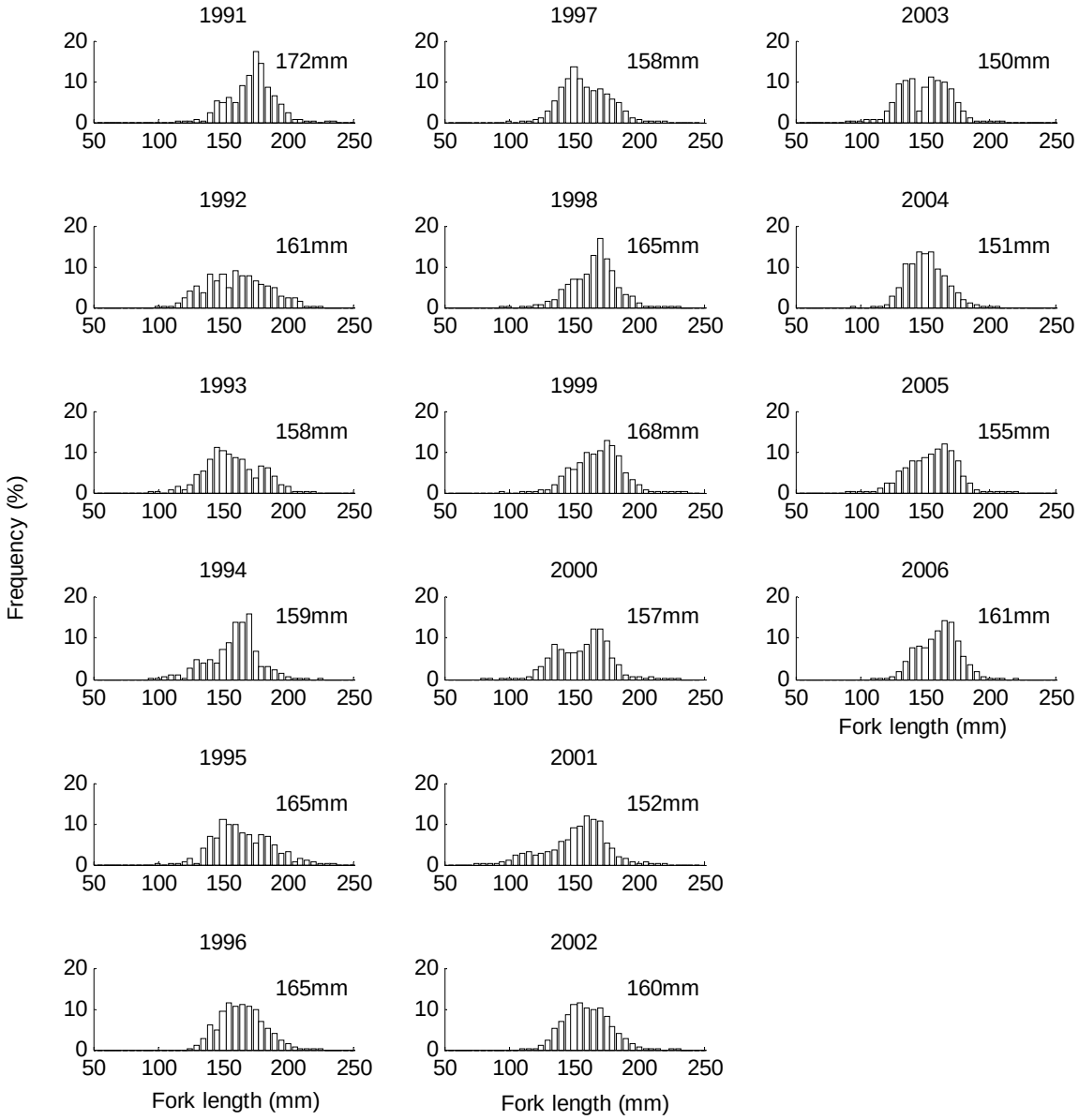


**Figure 2. Stout whiting length frequencies and mean length per year.**

## Length–weight

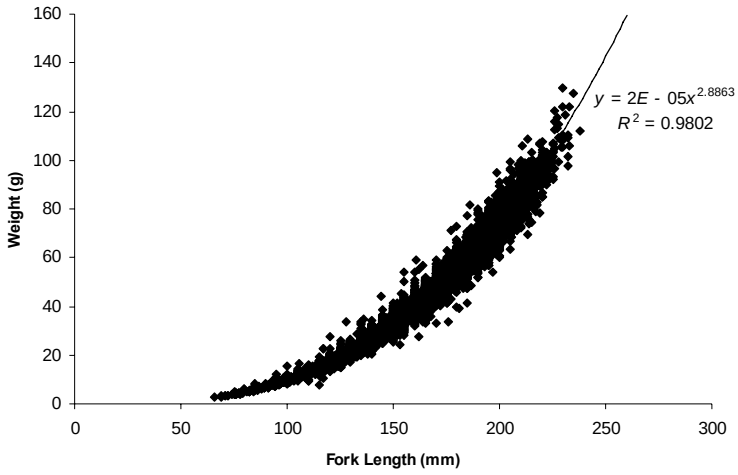


**Figure 3. Length–weight relationship for stout whiting sampled from 1991 to 2006 (*n* = 6964).**

## Age frequency

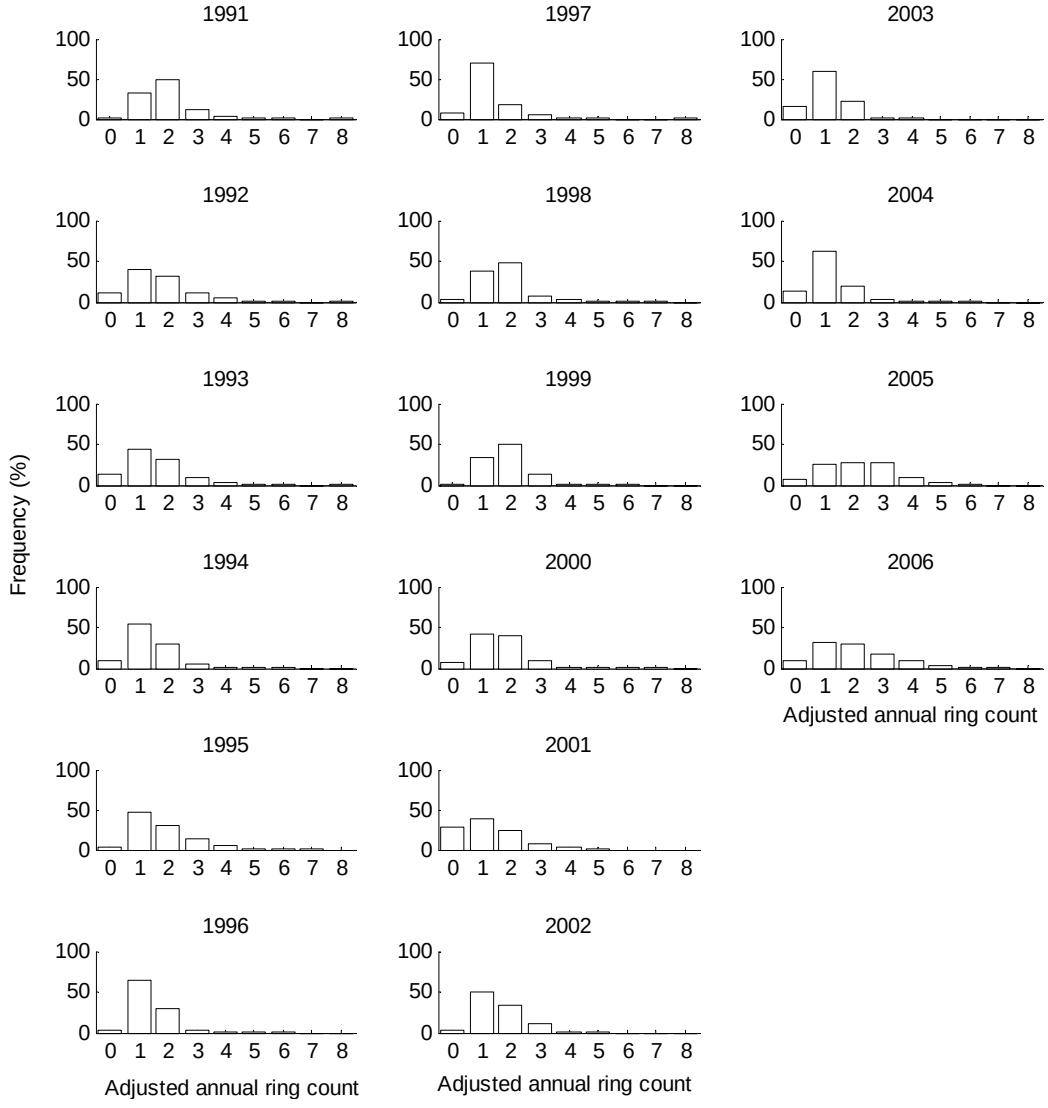


**Figure 4. Stout whiting catch at age frequencies sampled from 1991 to 2006 (*n* = 6953).**

## Growth

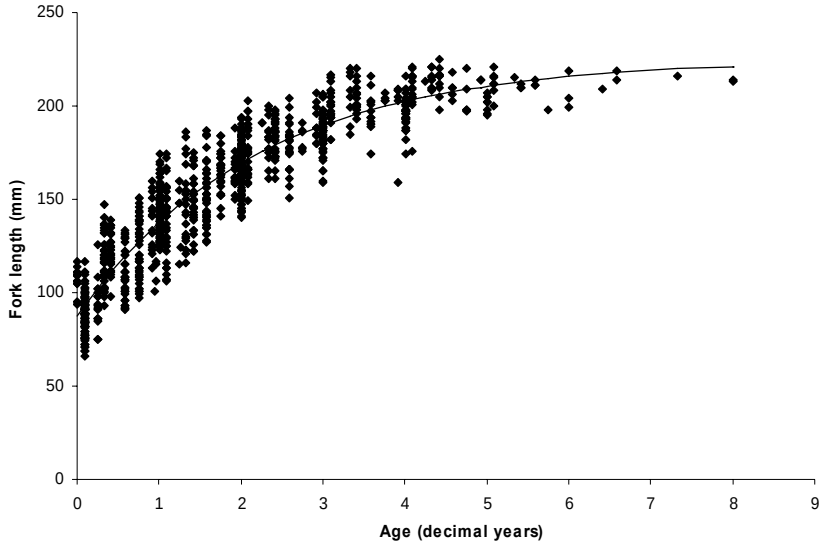


**Figure 5. Length at age for stout whiting from the stratified research surveys in 1993 and 1994 (*n* = 1001).**

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# Appendix A - Quality assurance results

## Bias

Age bias plots are used to detect unacceptable bias as described in LTMP Sampling Protocol—Fish Ageing (DPI&F 2007b). Bias was deemed acceptable in 2005 and 2006 (Figure 6).

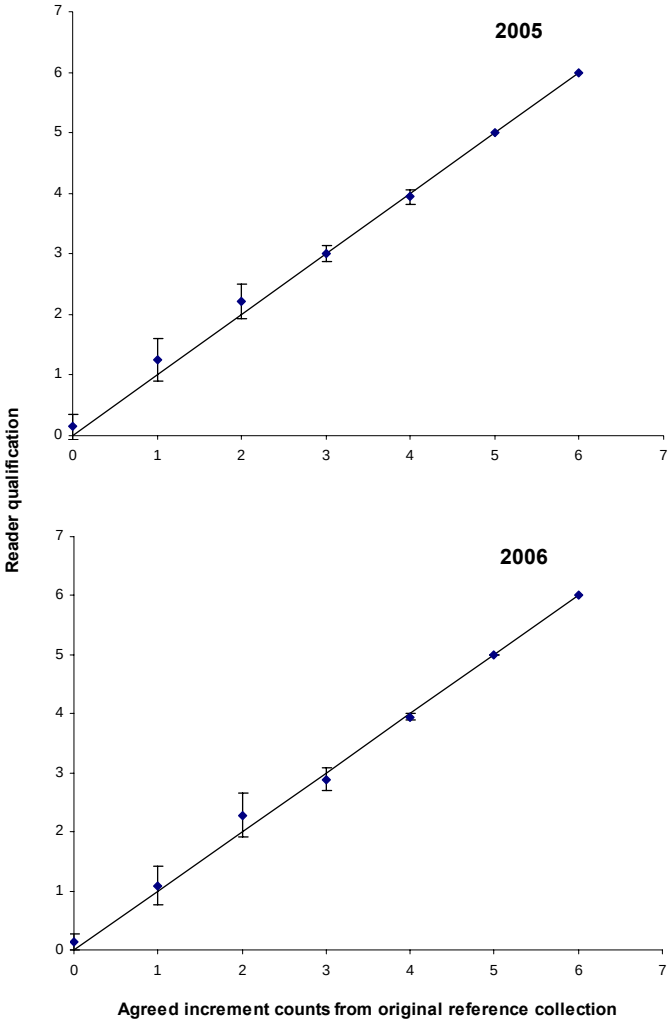


**Figure 6. Age bias plots presenting mean increment counts and 95% confidence intervals for each increment count in the reference collection. The 1 : 1 equivalence line is indicated by the solid line.**

## Precision

Precision is measured by calculating the index of average percentage error (IAPE) as described in LTMP Sampling Protocol—Fish Ageing (DPI&F 2007b). In 2005, the IAPE was 8.4% and in 2006 it was lower at 7.3%. In 2006, a threshold level of IAPE for stout whiting was set at 8%. In 2006, the otolith reader qualified to read the current sample by having an IAPE of 7.3% following the protocol described in Fish Ageing (DPI&F 2007b).

# Appendix B - Age–length keys

## Age–length keys per year showing proportion of fish in each 5 mm length class per age group

1991 and 1992, *n* = 1001 (constructed from pooled data from 1993 and 1994 as age data were not available for these years)

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | 1.00 | | | | | | | | | 1 |
| 75 | 1.00 | | | | | | | | | 1 |
| 80 | 1.00 | | | | | | | | | 4 |
| 85 | 1.00 | | | | | | | | | 5 |
| 90 | 1.00 | | | | | | | | | 11 |
| 95 | 1.00 | | | | | | | | | 31 |
| 100 | 1.00 | | | | | | | | | 32 |
| 105 | 1.00 | | | | | | | | | 41 |
| 110 | 1.00 | | | | | | | | | 39 |
| 115 | 1.00 | | | | | | | | | 42 |
| 120 | 1.00 | | | | | | | | | 27 |
| 125 | 0.73 | 0.28 | | | | | | | | 41 |
| 130 | 0.72 | 0.28 | | | | | | | | 32 |
| 135 | 0.50 | 0.50 | | | | | | | | 31 |
| 140 | 0.59 | 0.41 | | | | | | | | 33 |
| 145 | 0.08 | 0.89 | | 0.03 | | | | | | 33 |
| 150 | | 0.91 | 0.03 | | | | | | | 34 |
| 155 | 0.02 | 0.93 | 0.04 | | | | | | | 45 |
| 160 | | 0.84 | 0.16 | | | | | | | 52 |
| 165 | | 0.63 | 0.37 | | | | | | | 39 |
| 170 | | 0.56 | 0.38 | 0.06 | | | | | | 34 |
| 175 | | 0.22 | 0.72 | 0.05 | | | | | | 50 |
| 180 | | 0.20 | 0.78 | 0.02 | | | | | | 50 |
| 185 | | 0.09 | 0.73 | 0.15 | 0.04 | | | | | 35 |
| 190 | | 0.02 | 0.57 | 0.39 | 0.02 | | | | | 28 |
| 195 | | | 0.50 | 0.37 | 0.12 | 0.02 | | | | 52 |
| 200 | | | 0.19 | 0.58 | 0.19 | 0.04 | | | | 57 |
| 205 | | | 0.08 | 0.33 | 0.46 | 0.10 | 0.03 | | | 37 |
| 210 | | | | 0.28 | 0.45 | 0.23 | 0.05 | | | 40 |
| 215 | | | | 0.20 | 0.47 | 0.20 | 0.03 | 0.03 | 0.07 | 30 |
| 220 | | | | 0.27 | 0.53 | 0.07 | 0.13 | | | 13 |
| 225 | | | | | 1.00 | | | | | 1 |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1993, *n* =311

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | 1.00 | | | | | | | | | 1 |
| 75 | 1.00 | | | | | | | | | 1 |
| 80 | 1.00 | | | | | | | | | 2 |
| 85 | 1.00 | | | | | | | | | 1 |
| 90 | 1.00 | | | | | | | | | 1 |
| 95 | 1.00 | | | | | | | | | 16 |
| 100 | 1.00 | | | | | | | | | 8 |
| 105 | 1.00 | | | | | | | | | 10 |
| 110 | 1.00 | | | | | | | | | 8 |
| 115 | 1.00 | | | | | | | | | 5 |
| 120 | 1.00 | | | | | | | | | 2 |
| 125 | 1.00 | | | | | | | | | 1 |
| 130 | 1.00 | | | | | | | | | 4 |
| 135 | 1.00 | | | | | | | | | 4 |
| 140 | 1.00 | | | | | | | | | 7 |
| 145 | | 1.00 | | | | | | | | 10 |
| 150 | | 1.00 | | | | | | | | 10 |
| 155 | | 0.94 | 0.06 | | | | | | | 17 |
| 160 | | 0.75 | 0.25 | | | | | | | 26 |
| 165 | | 0.64 | 0.36 | | | | | | | 20 |
| 170 | | 0.56 | 0.38 | 0.06 | | | | | | 11 |
| 175 | | 0.14 | 0.71 | 0.14 | | | | | | 21 |
| 180 | | 0.12 | 0.84 | 0.04 | | | | | | 25 |
| 185 | | 0.03 | 0.67 | 0.27 | 0.03 | | | | | 10 |
| 190 | | | 0.57 | 0.39 | 0.04 | | | | | 10 |
| 195 | | | 0.36 | 0.52 | 0.12 | | | | | 25 |
| 200 | | | 0.13 | 0.42 | 0.38 | 0.08 | | | | 24 |
| 205 | | | | 0.11 | 0.68 | 0.16 | 0.05 | | | 17 |
| 210 | | | | 0.33 | 0.33 | 0.25 | 0.08 | | | 12 |
| 215 | | | | | | | | | | |
| 220 | | | | | 0.50 | | 0.50 | | | 2 |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1994, *n* = 690

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | 1.00 | | | | | | | | | 2 |
| 85 | 1.00 | | | | | | | | | 4 |
| 90 | 1.00 | | | | | | | | | 10 |
| 95 | 1.00 | | | | | | | | | 15 |
| 100 | 1.00 | | | | | | | | | 24 |
| 105 | 1.00 | | | | | | | | | 31 |
| 110 | 1.00 | | | | | | | | | 31 |
| 115 | 1.00 | | | | | | | | | 37 |
| 120 | 1.00 | | | | | | | | | 25 |
| 125 | 0.73 | 0.28 | | | | | | | | 40 |
| 130 | 0.68 | 0.32 | | | | | | | | 28 |
| 135 | 0.42 | 0.58 | | | | | | | | 27 |
| 140 | 0.58 | 0.42 | | | | | | | | 26 |
| 145 | 0.13 | 0.83 | | 0.04 | | | | | | 23 |
| 150 | | 0.96 | 0.04 | | | | | | | 24 |
| 155 | 0.04 | 0.93 | 0.04 | | | | | | | 28 |
| 160 | | 0.92 | 0.08 | | | | | | | 26 |
| 165 | | 0.63 | 0.37 | | | | | | | 19 |
| 170 | | 0.57 | 0.39 | 0.04 | | | | | | 23 |
| 175 | | 0.28 | 0.72 | | | | | | | 29 |
| 180 | | 0.28 | 0.72 | | | | | | | 25 |
| 185 | | 0.16 | 0.80 | | 0.04 | | | | | 25 |
| 190 | | 0.06 | 0.56 | 0.39 | | | | | | 18 |
| 195 | | | 0.63 | 0.22 | 0.11 | 0.04 | | | | 27 |
| 200 | | | 0.24 | 0.70 | 0.06 | | | | | 33 |
| 205 | | | 0.15 | 0.55 | 0.25 | 0.05 | | | | 20 |
| 210 | | | | 0.25 | 0.50 | 0.21 | 0.04 | | | 28 |
| 215 | | | | 0.21 | 0.50 | 0.21 | 0.04 | 0.04 | | 28 |
| 220 | | | | 0.31 | 0.54 | 0.08 | 0.08 | | | 13 |
| 225 | | | | | 1.00 | | | | | 1 |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1995, *n* = 454

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 105 | 1.00 | | | | | | | | | 1 |
| 110 | 1.00 | | | | | | | | | 2 |
| 115 | 1.00 | | | | | | | | | 7 |
| 120 | 1.00 | | | | | | | | | 2 |
| 125 | 1.00 | | | | | | | | | 8 |
| 130 | 0.50 | 0.50 | | | | | | | | 12 |
| 135 | 0.29 | 0.71 | | | | | | | | 17 |
| 140 | 0.14 | 0.86 | | | | | | | | 21 |
| 145 | 0.14 | 0.86 | | | | | | | | 28 |
| 150 | | 0.85 | 0.10 | 0.05 | | | | | | 20 |
| 155 | | 0.95 | 0.05 | | | | | | | 22 |
| 160 | | 0.90 | 0.10 | | | | | | | 31 |
| 165 | | 0.84 | 0.16 | | | | | | | 19 |
| 170 | | 0.56 | 0.44 | | | | | | | 25 |
| 175 | | 0.25 | 0.67 | 0.08 | | | | | | 12 |
| 180 | | 0.13 | 0.78 | 0.09 | | | | | | 32 |
| 185 | | 0.04 | 0.67 | 0.29 | | | | | | 24 |
| 190 | | | 0.65 | 0.30 | 0.04 | | | | | 23 |
| 195 | | | 0.40 | 0.55 | 0.05 | | | | | 20 |
| 200 | | | 0.27 | 0.59 | 0.14 | | | | | 22 |
| 205 | | | 0.20 | 0.52 | 0.24 | 0.04 | | | | 25 |
| 210 | | | | 0.35 | 0.48 | 0.17 | | | | 23 |
| 215 | | | | 0.32 | 0.59 | 0.09 | | | | 22 |
| 220 | | | | 0.06 | 0.63 | 0.13 | | 0.06 | | 16 |
| 225 | | | | 0.23 | 0.38 | 0.31 | 0.08 | | | 13 |
| 230 | | | | 0.14 | 0.43 | 0.14 | 0.29 | | | 7 |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1996, *n* = 444

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 105 | | | | | | | | | | |
| 110 | | | | | | | | | | |
| 115 | | | | | | | | | | |
| 120 | | | | | | | | | | |
| 125 | | 1.00 | | | | | | | | 1 |
| 130 | 0.56 | 0.44 | | | | | | | | 9 |
| 135 | 0.27 | 0.73 | | | | | | | | 22 |
| 140 | 0.22 | 0.78 | | | | | | | | 18 |
| 145 | 0.06 | 0.90 | 0.33 | | | | | | | 30 |
| 150 | 0.04 | 0.84 | | | | | | | | 28 |
| 155 | 0.03 | 0.89 | 0.08 | | | | | | | 37 |
| 160 | | 0.88 | 0.12 | | | | | | | 26 |
| 165 | | 0.94 | 0.06 | | | | | | | 16 |
| 170 | | 0.69 | 0.31 | | | | | | | 29 |
| 175 | | 0.56 | 0.44 | | | | | | | 25 |
| 180 | | 0.38 | 0.57 | | | | | | | 21 |
| 185 | | 0.30 | 0.67 | 0.03 | | | | | | 30 |
| 190 | | 0.32 | 0.68 | | | | | | | 19 |
| 195 | | | 0.78 | 0.17 | 0.04 | | | | | 23 |
| 200 | | | 0.55 | 0.33 | 0.07 | 0.04 | | | | 27 |
| 205 | | 0.04 | 0.20 | 0.64 | 0.04 | 0.08 | | | | 25 |
| 210 | | | 0.14 | 0.77 | 0.05 | 0.05 | | | | 22 |
| 215 | | | 0.04 | 0.55 | 0.36 | | 0.05 | | | 22 |
| 220 | | | | 0.25 | 0.42 | 0.33 | | | | 12 |
| 225 | | | | | | 0.50 | 0.50 | | | 2 |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1997, *n* = 492

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 105 | | | | | | | | | | |
| 110 | 1.00 | | | | | | | | | 3 |
| 115 | 1.00 | | | | | | | | | 5 |
| 120 | 1.00 | | | | | | | | | 6 |
| 125 | 0.89 | 0.11 | | | | | | | | 18 |
| 130 | 0.84 | 0.16 | | | | | | | | 32 |
| 135 | 0.32 | 0.68 | | | | | | | | 37 |
| 140 | 0.18 | 0.82 | | | | | | | | 34 |
| 145 | 0.18 | 0.82 | | | | | | | | 33 |
| 150 | 0.04 | 0.96 | | | | | | | | 23 |
| 155 | 0.08 | 0.92 | | | | | | | | 26 |
| 160 | | 1.00 | | | | | | | | 31 |
| 165 | | 0.81 | 0.19 | | | | | | | 27 |
| 170 | | 0.74 | 0.26 | | | | | | | 23 |
| 175 | | 0.70 | 0.26 | 0.04 | | | | | | 27 |
| 180 | | 0.40 | 0.50 | 0.10 | | | | | | 20 |
| 185 | | 0.26 | 0.67 | 0.07 | | | | | | 27 |
| 190 | | | 0.61 | 0.36 | 0.04 | | | | | 28 |
| 195 | | 0.04 | 0.44 | 0.40 | 0.08 | 0.04 | | | | 25 |
| 200 | | 0.04 | 0.33 | 0.48 | 0.11 | 0.04 | | | | 27 |
| 205 | | 0.05 | 0.10 | 0.52 | 0.29 | 0.05 | | | | 21 |
| 210 | | | 0.18 | 0.45 | 0.27 | 0.09 | | | | 11 |
| 215 | | | | | 0.60 | 0.40 | | | | 5 |
| 220 | | | | | | 0.67 | | | 0.33 | 3 |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1998, *n* = 491

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | 1.00 | | | | | | | | | 1 |
| 105 | 1.00 | | | | | | | | | 2 |
| 110 | 1.00 | | | | | | | | | 5 |
| 115 | 1.00 | | | | | | | | | 4 |
| 120 | 0.64 | 0.36 | | | | | | | | 11 |
| 125 | 0.69 | 0.31 | | | | | | | | 13 |
| 130 | 0.59 | 0.41 | | | | | | | | 22 |
| 135 | 0.41 | 0.59 | | | | | | | | 27 |
| 140 | 0.24 | 0.76 | | | | | | | | 25 |
| 145 | 0.16 | 0.84 | | | | | | | | 25 |
| 150 | 0.04 | 0.96 | | | | | | | | 27 |
| 155 | 0.05 | 0.82 | 0.13 | | | | | | | 38 |
| 160 | 0.03 | 0.72 | 0.25 | | | | | | | 32 |
| 165 | 0.05 | 0.43 | 0.52 | | | | | | | 21 |
| 170 | | 0.26 | 0.74 | | | | | | | 19 |
| 175 | | 0.36 | 0.55 | 0.09 | | | | | | 22 |
| 180 | | 0.14 | 0.83 | 0.03 | | | | | | 29 |
| 185 | | 0.04 | 0.68 | 0.23 | | | | | | 22 |
| 190 | | | 0.62 | 0.27 | 0.05 | | | | | 26 |
| 195 | | 0.04 | 0.32 | 0.40 | 0.12 | 0.08 | | | | 25 |
| 200 | | | 0.16 | 0.24 | 0.16 | 0.12 | 0.04 | 0.04 | | 25 |
| 205 | | | 0.83 | 0.37 | 0.08 | 0.08 | | | | 24 |
| 210 | | | | 0.28 | | 0.28 | | | | 14 |
| 215 | | | | 0.14 | | 0.24 | 0.09 | | | 21 |
| 220 | | | | | | 0.60 | 0.20 | | | 5 |
| 225 | | | | | | 0.75 | | 0.25 | | 4 |
| 230 | | | | | | | 0.50 | | | 2 |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

1999, *n* = 470

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 105 | 1.00 | | | | | | | | | 2 |
| 110 | 1.00 | | | | | | | | | 3 |
| 115 | 1.00 | | | | | | | | | 3 |
| 120 | 0.80 | 0.20 | | | | | | | | 10 |
| 125 | 0.56 | 0.44 | | | | | | | | 9 |
| 130 | 0.32 | 0.43 | | | | | | | | 14 |
| 135 | 0.06 | 0.68 | | | | | | | | 19 |
| 140 | 0.03 | 0.93 | | | | | | | | 15 |
| 145 | 0.56 | 0.78 | 0.03 | | | | | | | 30 |
| 150 | | 0.77 | 0.17 | | | | | | | 18 |
| 155 | | 0.59 | 0.23 | | | | | | | 26 |
| 160 | 0.04 | 0.62 | 0.32 | 0.05 | | | | | | 22 |
| 165 | | 0.27 | 0.38 | | | | | | | 26 |
| 170 | | 0.26 | 0.69 | 0.03 | | | | | | 29 |
| 175 | | | 0.70 | 0.04 | | | | | | 23 |
| 180 | | | 0.89 | 0.07 | | | | | | 27 |
| 185 | | | 0.68 | 0.25 | | | | | | 28 |
| 190 | | | 0.45 | 0.55 | | | | | | 22 |
| 195 | | | 0.31 | 0.50 | 0.15 | | | | | 26 |
| 200 | | | 0.37 | 0.47 | 0.17 | | | | | 30 |
| 205 | | | 0.04 | 0.52 | 0.28 | 0.08 | 0.04 | | | 25 |
| 210 | | | 0.04 | 0.71 | 0.17 | 0.04 | 0.04 | | | 24 |
| 215 | | | 0.17 | 0.13 | 0.48 | 0.13 | 0.09 | | | 23 |
| 220 | | | | 0.33 | 0.25 | 0.25 | 0.17 | | | 12 |
| 225 | | | | 0.25 | | 0.75 | | | | 4 |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2000, *n* = 494

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | 1.00 | | | | | | | | | 1 |
| 95 | 1.00 | | | | | | | | | 1 |
| 100 | 1.00 | | | | | | | | | 4 |
| 105 | 1.00 | | | | | | | | | 3 |
| 110 | 0.83 | 0.17 | | | | | | | | 10 |
| 115 | 0.91 | 0.09 | | | | | | | | 11 |
| 120 | 0.80 | 0.20 | | | | | | | | 25 |
| 125 | 0.67 | 0.33 | | | | | | | | 26 |
| 130 | 0.39 | 0.61 | | | | | | | | 23 |
| 135 | 0.25 | 0.61 | | | | | | | | 28 |
| 140 | 0.14 | 0.75 | | | | | | | | 20 |
| 145 | 0.04 | 0.86 | | | | | | | | 29 |
| 150 | 0.04 | 0.81 | 0.15 | | | | | | | 26 |
| 155 | | 0.89 | 0.11 | | | | | | | 19 |
| 160 | | 0.63 | 0.33 | 0.04 | | | | | | 26 |
| 165 | | 0.61 | 0.39 | | | | | | | 23 |
| 170 | | 0.13 | 0.83 | 0.04 | | | | | | 23 |
| 175 | | 0.14 | 0.73 | 0.14 | | | | | | 22 |
| 180 | | 0.12 | 0.60 | 0.24 | | 0.04 | | | | 25 |
| 185 | | 0.03 | 0.65 | 0.29 | 0.03 | | | | | 31 |
| 190 | | 0.05 | 0.48 | 0.48 | | | | | | 21 |
| 195 | | | 0.23 | 0.64 | 0.14 | | | | | 22 |
| 200 | | | 0.29 | 0.38 | 0.33 | | | | | 21 |
| 205 | | | 0.06 | 0.56 | 0.31 | 0.06 | | | | 16 |
| 210 | | | | 0.53 | 0.27 | 0.13 | 0.07 | | | 15 |
| 215 | | | | 0.44 | 0.22 | 0.33 | | | | 9 |
| 220 | | | | 0.20 | 0.60 | 0.20 | | | | 5 |
| 225 | | | | 0.50 | 0.25 | 0.25 | | | | 4 |
| 230 | | | | | 0.40 | 0.40 | | 0.20 | | 5 |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2001, *n* = 487

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | 1.00 | | | | | | | | 2 |
| 90 | 0.33 | 0.33 | 0.33 | | | | | | | 3 |
| 95 | 1.00 | | | | | | | | | 2 |
| 100 | 0.38 | 0.50 | 0.13 | | | | | | | 8 |
| 105 | 0.33 | | 0.67 | | | | | | | 3 |
| 110 | 0.50 | 0.50 | | | | | | | | 4 |
| 115 | 0.50 | 0.50 | | | | | | | | 4 |
| 120 | 0.33 | 0.56 | | 0.11 | | | | | | 9 |
| 125 | 0.25 | 0.50 | 0.25 | | | | | | | 16 |
| 130 | 0.53 | 0.26 | 0.21 | | | | | | | 19 |
| 135 | 0.29 | 0.39 | 0.21 | 0.11 | | | | | | 28 |
| 140 | 0.36 | 0.21 | 0.21 | 0.15 | 0.06 | | | | | 33 |
| 145 | 0.38 | 0.34 | 0.17 | 0.03 | 0.07 | | | | | 29 |
| 150 | 0.47 | 0.38 | 0.16 | | | | | | | 32 |
| 155 | 0.32 | 0.39 | 0.16 | 0.10 | 0.03 | | | | | 31 |
| 160 | 0.24 | 0.42 | 0.21 | 0.08 | 0.05 | | | | | 38 |
| 165 | 0.28 | 0.39 | 0.19 | 0.06 | 0.08 | | | | | 36 |
| 170 | 0.25 | 0.31 | 0.33 | | | | | | | 36 |
| 175 | 0.13 | 0.38 | 0.46 | | | | | | | 24 |
| 180 | 0.14 | 0.41 | 0.32 | | 0.03 | | | | | 37 |
| 185 | 0.40 | 0.40 | 0.16 | | | | | | | 25 |
| 190 | 0.09 | 0.53 | 0.24 | | 0.03 | | | | | 34 |
| 195 | 0.18 | 0.36 | 0.27 | 0.09 | 0.09 | | | | | 12 |
| 200 | 0.07 | 0.67 | 0.27 | | | | | | | 15 |
| 205 | | 0.60 | 0.20 | | 0.20 | | | | | 5 |
| 210 | | | | | | | | | | |
| 215 | | 0.50 | 0.50 | | | | | | | 2 |
| 220 | | | | | | | | | | |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2002, $n = 552$

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 105 | | | | | | | | | | |
| 110 | | 1.00 | | | | | | | | 1 |
| 115 | 0.80 | 0.20 | | | | | | | | 5 |
| 120 | 1.00 | | | | | | | | | 11 |
| 125 | 0.61 | 0.39 | | | | | | | | 31 |
| 130 | 0.44 | 0.56 | | | | | | | | 34 |
| 135 | 0.24 | 0.76 | | | | | | | | 29 |
| 140 | 0.12 | 0.88 | | | | | | | | 43 |
| 145 | 0.10 | 0.83 | 0.07 | | | | | | | 29 |
| 150 | 0.04 | 0.79 | 0.18 | | | | | | | 28 |
| 155 | | 0.83 | 0.17 | | | | | | | 30 |
| 160 | | 0.81 | 0.19 | | | | | | | 21 |
| 165 | | 0.52 | 0.48 | | | | | | | 29 |
| 170 | | 0.32 | 0.68 | | | | | | | 34 |
| 175 | | 0.33 | 0.50 | 0.17 | | | | | | 30 |
| 180 | | 0.03 | 0.70 | 0.20 | 0.07 | | | | | 30 |
| 185 | | | 0.41 | 0.56 | 0.04 | | | | | 27 |
| 190 | | 0.05 | 0.38 | 0.54 | 0.03 | | | | | 39 |
| 195 | | | 0.37 | 0.63 | | | | | | 30 |
| 200 | | | 0.27 | 0.40 | 0.33 | | | | | 30 |
| 205 | | | 0.22 | 0.43 | 0.35 | | | | | 23 |
| 210 | | | | 0.18 | 0.73 | 0.09 | | | | 10 |
| 215 | | | | 0.25 | 0.75 | | | | | 4 |
| 220 | | | | 1.00 | | | | | | 1 |
| 225 | | | | | 1.00 | | | | | 1 |
| 230 | | | | | 0.50 | 0.50 | | | | 2 |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2003, *n* = 485

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | 1.00 | | | | | | | | | 1 |
| 95 | 1.00 | | | | | | | | | 1 |
| 100 | 1.00 | | | | | | | | | 3 |
| 105 | 1.00 | | | | | | | | | 10 |
| 110 | 0.88 | 0.13 | | | | | | | | 8 |
| 115 | 1.00 | | | | | | | | | 13 |
| 120 | 0.95 | 0.05 | | | | | | | | 21 |
| 125 | 0.93 | 0.07 | | | | | | | | 27 |
| 130 | 0.65 | 0.35 | | | | | | | | 26 |
| 135 | 0.46 | 0.54 | | | | | | | | 26 |
| 140 | 0.24 | 0.69 | 0.07 | | | | | | | 29 |
| 145 | 0.04 | 0.96 | | | | | | | | 28 |
| 150 | 0.07 | 0.86 | 0.07 | | | | | | | 29 |
| 155 | | 0.81 | 0.19 | | | | | | | 31 |
| 160 | | 0.71 | 0.29 | | | | | | | 31 |
| 165 | | 0.63 | 0.37 | | | | | | | 27 |
| 170 | | 0.62 | 0.38 | | | | | | | 29 |
| 175 | | 0.37 | 0.63 | | | | | | | 27 |
| 180 | 0.06 | 0.52 | 0.39 | 0.03 | | | | | | 31 |
| 185 | 0.04 | 0.32 | 0.54 | 0.11 | | | | | | 28 |
| 190 | | 0.18 | 0.64 | 0.14 | 0.05 | | | | | 22 |
| 195 | | 0.06 | 0.56 | 0.38 | | | | | | 16 |
| 200 | 0.17 | 0.25 | 0.25 | 0.33 | | | | | | 12 |
| 205 | | 0.29 | 0.43 | | 0.29 | | | | | 7 |
| 210 | | | 0.50 | 0.50 | | | | | | 2 |
| 215 | | | | | | | | | | |
| 220 | | | | | | | | | | |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2004, *n* = 490

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | 1.00 | | | | | | | | | 1 |
| 100 | | | | | | | | | | |
| 105 | | 1.00 | | | | | | | | 1 |
| 110 | 0.50 | 0.50 | | | | | | | | 2 |
| 115 | 0.78 | 0.22 | | | | | | | | 9 |
| 120 | 0.62 | 0.38 | | | | | | | | 21 |
| 125 | 0.47 | 0.53 | | | | | | | | 17 |
| 130 | 0.47 | 0.53 | | | | | | | | 19 |
| 135 | 0.37 | 0.57 | 0.03 | 0.03 | | | | | | 34 |
| 140 | 0.16 | 0.84 | | | | | | | | 25 |
| 145 | 0.28 | 0.72 | | | | | | | | 32 |
| 150 | 0.07 | 0.71 | 0.21 | | | | | | | 31 |
| 155 | 0.06 | 0.69 | 0.26 | | | | | | | 35 |
| 160 | 0.03 | 0.78 | 0.19 | | | | | | | 36 |
| 165 | 0.08 | 0.74 | 0.23 | | | | | | | 31 |
| 170 | 0.08 | 0.38 | 0.46 | 0.08 | | | | | | 39 |
| 175 | | 0.35 | 0.54 | | 0.04 | | | | | 26 |
| 180 | 0.03 | 0.13 | 0.61 | 0.16 | 0.03 | 0.03 | 0.03 | | | 31 |
| 185 | | 0.21 | 0.38 | 0.34 | 0.03 | | | | | 29 |
| 190 | | 0.06 | 0.45 | 0.39 | 0.10 | | | | | 31 |
| 195 | | 0.08 | 0.33 | 0.58 | | | | | | 24 |
| 200 | | | 0.31 | 0.62 | | 0.08 | | | | 13 |
| 205 | | | 0.40 | 0.60 | | | | | | 3 |
| 210 | | | | | | | | | | |
| 215 | | | | | | | | | | |
| 220 | | | | | | | | | | |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2005, $n = 619$

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | 1.00 | | | | | | | | | 1 |
| 85 | 1.00 | | | | | | | | | 1 |
| 90 | 0.86 | 0.14 | | | | | | | | 7 |
| 95 | 0.92 | 0.08 | | | | | | | | 12 |
| 100 | 0.33 | 0.67 | | | | | | | | 9 |
| 105 | 0.54 | 0.46 | | | | | | | | 26 |
| 110 | 0.26 | 0.57 | 0.17 | | | | | | | 23 |
| 115 | 0.42 | 0.47 | 0.11 | | | | | | | 19 |
| 120 | 0.60 | 0.30 | 0.10 | | | | | | | 10 |
| 125 | 0.32 | 0.53 | 0.16 | | | | | | | 19 |
| 130 | 0.46 | 0.46 | 0.05 | 0.03 | | | | | | 37 |
| 135 | 0.33 | 0.57 | 0.07 | 0.03 | | | | | | 30 |
| 140 | 0.33 | 0.48 | 0.19 | | | | | | | 27 |
| 145 | 0.21 | 0.34 | 0.38 | 0.07 | | | | | | 29 |
| 150 | | 0.48 | 0.42 | 0.10 | | | | | | 31 |
| 155 | | 0.37 | 0.37 | 0.26 | | | | | | 27 |
| 160 | | 0.34 | 0.31 | 0.24 | 0.10 | | | | | 29 |
| 165 | | 0.17 | 0.30 | 0.40 | 0.13 | | | | | 30 |
| 170 | | 0.07 | 0.37 | 0.37 | 0.13 | 0.07 | | | | 30 |
| 175 | | 0.03 | 0.36 | 0.48 | 0.06 | 0.06 | | | | 33 |
| 180 | | | 0.16 | 0.58 | 0.16 | 0.10 | | | | 31 |
| 185 | | 0.03 | 0.13 | 0.40 | 0.40 | 0.05 | | | | 40 |
| 190 | | | 0.06 | 0.34 | 0.57 | 0.03 | | | | 35 |
| 195 | | | 0.03 | 0.34 | 0.46 | 0.14 | 0.03 | | | 35 |
| 200 | | | 0.13 | 0.34 | 0.44 | 0.06 | 0.03 | | | 32 |
| 205 | | | | 0.18 | 0.36 | 0.27 | 0.18 | | | 11 |
| 210 | | | | 0.33 | 0.67 | | | | | 3 |
| 215 | | | | 0.50 | | 0.50 | | | | 2 |
| 220 | | | | | | | | | | |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |

2006, $n = 457$

| Fork length (mm) | Age | | | | | | | | | Total number of fish |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| < 70 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 105 | | | | | | | | | | |
| 110 | | | | | | | | | | |
| 115 | 1.00 | | | | | | | | | 1 |
| 120 | 0.75 | 0.25 | | | | | | | | 8 |
| 125 | 0.79 | 0.16 | 0.05 | | | | | | | 19 |
| 130 | 0.71 | 0.29 | | | | | | | | 17 |
| 135 | 0.68 | 0.32 | | | | | | | | 28 |
| 140 | 0.61 | 0.29 | 0.11 | | | | | | | 28 |
| 145 | 0.36 | 0.44 | 0.16 | | | | | | | 25 |
| 150 | 0.21 | 0.54 | 0.25 | | | | | | | 28 |
| 155 | | 0.77 | 0.23 | | | | | | | 31 |
| 160 | 0.03 | 0.60 | 0.27 | 0.10 | | | | | | 30 |
| 165 | | 0.31 | 0.53 | 0.16 | | | | | | 32 |
| 170 | 0.03 | 0.19 | 0.52 | 0.19 | 0.06 | | | | | 31 |
| 175 | | 0.17 | 0.31 | 0.31 | 0.14 | 0.07 | | | | 29 |
| 180 | | | 0.17 | 0.43 | 0.40 | | | | | 30 |
| 185 | | 0.10 | 0.38 | 0.31 | 0.17 | 0.03 | | | | 29 |
| 190 | | 0.06 | 0.33 | 0.33 | 0.22 | 0.06 | | | | 36 |
| 195 | | 0.03 | 0.41 | 0.31 | 0.21 | 0.03 | | | | 29 |
| 200 | | | | 0.31 | 0.31 | 0.31 | 0.08 | | | 13 |
| 205 | | | | | 0.50 | 0.33 | 0.17 | | | 6 |
| 210 | | | | 0.17 | 0.50 | 0.33 | | | | 6 |
| 215 | | | | | | | | | | |
| 220 | | | | | | | | 1.00 | | 1 |
| 225 | | | | | | | | | | |
| 230 | | | | | | | | | | |
| 235 | | | | | | | | | | |
| 240 | | | | | | | | | | |