Table 1: Indices used for staging reproductive condition and a description of the criteria for classifying mature and immature condition

|  |  |  |  |
| --- | --- | --- | --- |
| Organ | Index | Description | Maturity assumption |
| Female Uterus | U = 1 | Uniformly thin tubular structure | Immature |
|  | U = 2 | Thin, tubular structure, partly enlarged posteriorly | Immature |
|  | U = 3 | Uniformly enlarged tubular structure | Mature |
|  | U = 4 | *In utero* eggs present without macroscopically visible embryos present | Mature |
|  | U = 5 | *In utero* embryos macroscopically visible | Mature |
|  | U = 6 | Enlarged tubular structure distended | Mature |
|  |  |  |  |
| Male Clasper | C = 1 | Pliable with no calcification | Immature |
|  | C = 2 | Partly calcified | Immature |
|  | C = 3 | Rigid and fully calcified | Mature |

Table 2. Estimated life history parameters and standard errors for *C. limbatus* from the present study compared with those of *C. tilstoni* from previous studies in Queensland (Harry *et al.* (2013) and the Northern Territory (Stevens and Wiley 1986; Davenport and Stevens 1988).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Process | Parameter | Description | *C. limbatus* |  | *C. tilstoni* (QLD) |  | *C. tilstoni* (NT) |  |
|  |  |  | Female / Both | Male | Female / Both | Male | Female / Both | Male |
|  |  |  |  |  |  |  |  |  |
| Growth |  | Model type | von Bertalanffy |  | Logistic |  | von Bertalanffy |  |
|  | *L*∞ | Asymptotic length (cm) | 263.6 (6.4) | 241.9 (3.6) | 173.9 | 147.8 | 181.4 | 156.8 |
|  | *K* | Growth coefficient (yr-1) | 0.1418 (0.012) | 0.1565 (0.0088) | 0.2676 | 0.3479 | 0.19 | 0.25 |
|  | *L0* | Length at birth (cm) | 72.77 (0.3) |  | 64.48 | 62.91 | 59.68 | 59.28 |
|  | *CV*L | CV length at age | 0.0487 (0.0024) | |  |  |  |  |
| Weight | log(*β*1) | Weight length coefficient | -12.34 (0.082) |  | -12.64 |  | -12.26 |  |
|  | *β*2 | Weight length exponent | 3.061 (0.017) |  | 3.12 |  | 3.06 |  |
|  | σW | Variance | 0.1363 |  | 0.09209 |  |  |  |
| Maturity | *L*50 | 50 % maturity (cm) | 200.2 (1.5) |  | 124.7 | 119.9 | 120\* | 110\* |
|  | *L*95 | 95 % maturity (cm) | 216.2 (3) |  | 125 | 128 | 130\* | 120\* |
|  | *A*50 | 50 % maturity (yrs) | 8.334 (0.26) |  | 6.065 | 5.215 | 4\* | 3\* |
|  | *A*95 | 95 % maturity (yrs) | 9.738 (0.66) |  | 7.534 | 6.98 | 5\* | 4\* |
|  | *L*50ʹ | 50 % maternity (cm) |  |  | 137 |  | 130\* |  |
|  | *L*95ʹ | 95 % maternity (cm) |  |  | 137 |  | 140\* |  |
|  | *A*50ʹ | 50 % maternity (yrs) |  |  | 7.102 |  | 5\* |  |
|  | *A*95ʹ | 95 % maternity (yrs) |  |  | 9.293 |  | 6\* |  |
| Fecundity | *β*5 | Intercept / Mean | 6.6 (2.7) |  | -5.408 |  | 3 |  |
|  | *β*6 | Slope |  |  | 0.05725 |  |  |  |
|  | *PM*ax | Annual prop. pregnant | 0.33 - 0.5 |  | 0.833 - 1 |  | 1 |  |
|  | *R* | Sex ratio | 1:1 |  | 1:1 |  | 1:0.924 |  |
| \* approximate values not statistically derived | | | | | | | | | |

Table 3: Details of five pregnant female *C. limbatus* captured from northern New South Wales waters

Date Maternal TL (cm) No. embryos Mean embryo TL (cm) Comments

11 April 2010 217 7 44 3M 4F

21 April 2010 202 2 32 1M and 1 undeveloped egg

21 April 2010 246 8 48 2M 6F

21 April 2010 228 7 42 2M 5F

28 June 2009 264 9 55 4M 5F

9.4 (4.5)

0.11 (0.021)

*C. limbatus*

12 (5.2)

0.17 (0.021)

*C. tilstoni* (QLD)

18 (2.3)

14 (3.2)

26 (1.9)

19 (3.7)

45 (5.2)

42 (9.9)

11 (1.7)

9.4 (2.5)

15 (1.4)

13 (3.1)

29 (3.9)

28 (7.9)

*C. tilstoni* (NT)

B

N

µB

6 (0.44)

5.2 (0.61)

7.4 (0.39)

6.1 (0.64)

10 (0.63)

9.5 (1.1)

µN

3.3 (0.25)

3 (0.39)

3.9 (0.17)

3.5 (0.42)

5.4 (0.37)

5.2 (0.72)

r0

8.6 (3.3)

Sex

Female Male Female Male Female Male

σ2

σ2

r(yr1)

0.2 (0.031)

M(yr1)

0.1 (0.021)

0.13 (0.027)

0.09 (0.018)

0.12 (0.024)

0.074 (0.016)

0.082 (0.016)

Λ(yr1)

-0.31 (0.023)

-0.33 (0.042)

-0.26 (0.012)

-0.29 (0.032)

-0.19 (0.014)

-0.2 (0.026)

offspring, µ and σ2 are the mean and variance of ages in the population in numbers, *N*, and biomass, *B*. Values presented are the mean and standard errors derived from 1000 Monte Carlo simulations.

Table 4: Comparative demographic analysis of *C. limbatus* and *C. tilstoni*. Λ is the intrinsic rate of population decrease with age (gross productivity), *M* is the

instantaneous rate of natural mortality, *r* is the intrinsic rate of population increase with time (net productivity), r0 is lifetime female reproductive output of female