

Appendix 4:  
Table 1

Seilesing HI 2009, ALDER

RANGE

|              |             |         |             |     |               |   | Harald S | Hildegunn | Else    | Harald L | Lisbet  | Stian   | Merete  | Jarle   | Janicke | MODAL   | Prosent enighet | Presisjon |
|--------------|-------------|---------|-------------|-----|---------------|---|----------|-----------|---------|----------|---------|---------|---------|---------|---------|---------|-----------------|-----------|
| Stratum      | Sample year | Fish no | Fish length | Sex | Landing month |   | Leser 1  | Leser 2   | Leser 3 | Leser 4  | Leser 5 | Leser 6 | Leser 7 | Leser 8 | Leser 9 | (R1-R7) |                 | CV        |
| N6103, E0227 | 2009        | 1       | 1           | 49  | 1             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 5       | 4       | 3       | 4       | 78 %            | 13 %      |
| N6103, E0227 | 2009        | 2       | 2           | 68  | 2             | 2 | 6        | 6         | 7       | 6        | 6       | 6       | 7       | 6       | 7       | 4       | 67 %            | 8 %       |
| N6103, E0227 | 2009        | 3       | 3           | 56  | 1             | 2 | 5        | 5         | 5       | 5        | 5       | 5       | 5       | 5       | 5       | 5       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 4       | 4           | 54  | 2             | 2 | 5        | 5         | 5       | 5        | 5       | 5       | 5       | 5       | 5       | 5       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 5       | 5           | 60  | 1             | 2 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 7       | 7       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 6       | 6           | 58  | 2             | 2 | 5        | 5         | 5       | 5        | 5       | 5       | 5       | 5       | 5       | 5       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 7       | 7           | 66  | 2             | 2 | 8        | 8         | 7       | 8        | 8       | 8       | 8       | 8       | 8       | 8       | 89 %            | 4 %       |
| N6103, E0227 | 2009        | 8       | 8           | 55  | 2             | 2 | 5        | 5         | 5       | 5        | 5       | 5       | 5       | 5       | 5       | 5       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 9       | 9           | 62  | 1             | 2 | 7        | 7         | 7       | 7        | 8       | 8       | 8       | 7       | 7       | 7       | 67 %            | 7 %       |
| N6103, E0227 | 2009        | 10      | 10          | 55  | 2             | 2 | 6        | 6         | 6       | 6        | 6       | 6       | 7       | 6       | 6       | 6       | 78 %            | 7 %       |
| N6103, E0227 | 2009        | 11      | 11          | 52  | 2             | 2 | 5        | 5         | 5       | 5        | 5       | 5       | 5       | 5       | 5       | 5       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 12      | 12          | 53  | 1             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 4       | 5       | 5       | 4       | 78 %            | 10 %      |
| N6103, E0227 | 2009        | 13      | 13          | 61  | 1             | 2 | 6        | 5         | 6       | 5        | 5       | 6       | 6       | 6       | 6       | 6       | 67 %            | 9 %       |
| N6103, E0227 | 2009        | 14      | 14          | 71  | 1             | 2 | 9        | 9         | 9       | 9        | 9       | 9       | 9       | 9       | 9       | 9       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 15      | 15          | 70  | 2             | 2 | 7        | 6         | 6       | 7        | 7       | 7       | 6       | 8       | 7       | 7       | 56 %            | 10 %      |
| N6103, E0227 | 2009        | 16      | 16          | 75  | 1             | 2 | 8        | 8         | 7       | 7        | 8       | 8       | 8       | 7       | 7       | 8       | 56 %            | 7 %       |
| N6103, E0227 | 2009        | 17      | 17          | 58  | 2             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 5       | 5       | 4       | 4       | 78 %            | 10 %      |
| N6103, E0227 | 2009        | 18      | 18          | 44  | 2             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 4       | 4       | 4       | 4       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 19      | 19          | 40  | 1             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 4       | 4       | 4       | 4       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 20      | 20          | 56  | 2             | 2 | 7        | 7         | 7       | 7        | 7       | 6       | 7       | 6       | 7       | 7       | 78 %            | 7 %       |
| N6103, E0227 | 2009        | 21      | 21          | 44  | 1             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 4       | 4       | 4       | 4       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 22      | 22          | 50  | 2             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 4       | 4       | 4       | 4       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 23      | 23          | 76  | 1             | 2 | 8        | 8         | 8       | 8        | 8       | 8       | 8       | 8       | 8       | 8       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 24      | 24          | 54  | 2             | 2 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 7       | 7       | 100 %           | 0 %       |
| N6103, E0227 | 2009        | 25      | 25          | 63  | 1             | 2 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 7       | 7       | 100 %           | 0 %       |
| N6046.E0047  | 2009        | 1       | 26          | 56  | 1             | 2 | 5        | 5         | 5       | 5        | 5       | 5       | 6       | 5       | 5       | 5       | 89 %            | 7 %       |
| N6046.E0047  | 2009        | 2       | 27          | 54  | 2             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 5       | 4       | 4       | 4       | 89 %            | 8 %       |
| N6046.E0047  | 2009        | 3       | 28          | 44  | 2             | 2 | 4        | 4         | 4       | 4        | 4       | 4       | 4       | 4       | 4       | 4       | 100 %           | 0 %       |
| N6046.E0047  | 2009        | 4       | 29          | 62  | 1             | 2 | 6        | 6         | 6       | 6        | 6       | 6       | 6       | 7       | 6       | 6       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 1       | 30          | 83  | 1             | 8 | 9        | 8         | 9       | 9        | 9       | 9       | 9       | 9       | 8       | 9       | 78 %            | 5 %       |
| N7057,2E217  | 2008        | 2       | 31          | 75  | 2             | 8 | 6        | 6         | 6       | 6        | 7       | 6       | 6       | 7       | 6       | 6       | 78 %            | 7 %       |
| N7057,2E217  | 2008        | 3       | 32          | 90  | 1             | 8 | 8        | 8         | 8       | 9        | 8       | 8       | 9       | 9       | 8       | 8       | 67 %            | 6 %       |
| N7057,2E217  | 2008        | 4       | 33          | 69  | 1             | 8 | 6        | 6         | 6       | 6        | 6       | 6       | 7       | 6       | 6       | 6       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 5       | 34          | 81  | 1             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 8       | 7       | 6       | 7       | 78 %            | 7 %       |
| N7057,2E217  | 2008        | 6       | 35          | 74  | 1             | 8 | 9        | 9         | 9       | 10       | 9       | 9       | 10      | 8       | 8       | 9       | 56 %            | 8 %       |
| N7057,2E217  | 2008        | 7       | 36          | 64  | 2             | 8 | 6        | 6         | 7       | 7        | 6       | 6       | 7       | 6       | 6       | 6       | 67 %            | 8 %       |
| N7057,2E217  | 2008        | 8       | 37          | 85  | 2             | 8 | 9        | 9         | 10      | 10       | 10      | 9       | 10      | 9       | 9       | 9       | 56 %            | 6 %       |
| N7057,2E217  | 2008        | 9       | 38          | 79  | 1             | 8 | 9        | 9         | 9       | 9        | 9       | 9       | 9       | 9       | 9       | 9       | 89 %            | 4 %       |
| N7057,2E217  | 2008        | 10      | 39          | 69  | 2             | 8 | 6        | 6         | 7       | 7        | 6       | 6       | 8       | 7       | 6       | 6       | 56 %            | 11 %      |
| N7057,2E217  | 2008        | 11      | 40          | 77  | 2             | 8 | 8        | 9         | 9       | 9        | 8       | 9       | 9       | 8       | 8       | 9       | 56 %            | 6 %       |
| N7057,2E217  | 2008        | 12      | 41          | 80  | 1             | 8 | 6        | 6         | 7       | 7        | 6       | 6       | 7       | 8       | 6       | 6       | 56 %            | 11 %      |
| N7057,2E217  | 2008        | 13      | 42          | 83  | 1             | 8 | 9        | 9         | 9       | 10       | 9       | 9       | 10      | 8       | 6       | 6       | 56 %            | 14 %      |
| N7057,2E217  | 2008        | 14      | 43          | 82  | 1             | 8 | 8        | 8         | 8       | 8        | 8       | 8       | 8       | 8       | 7       | 8       | 89 %            | 4 %       |
| N7057,2E217  | 2008        | 15      | 44          | 83  | 1             | 8 | 8        | 8         | 8       | 8        | 7       | 8       | 9       | 9       | 8       | 8       | 67 %            | 7 %       |
| N7057,2E217  | 2008        | 16      | 45          | 77  | 2             | 8 | 9        | 9         | 9       | 9        | 9       | 9       | 9       | 9       | 8       | 9       | 89 %            | 4 %       |
| N7057,2E217  | 2008        | 17      | 46          | 77  | 2             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 7       | 7       | 100 %           | 0 %       |
| N7057,2E217  | 2008        | 18      | 47          | 78  | 1             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 8       | 7       | 6       | 78 %            | 7 %       |
| N7057,2E217  | 2008        | 19      | 48          | 86  | 2             | 8 | 9        | 9         | 10      | 10       | 9       | 9       | 10      | 9       | 8       | 9       | 67 %            | 7 %       |
| N7057,2E217  | 2008        | 20      | 49          | 84  | 2             | 8 | 10       | 10        | 11      | 11       | 11      | 10      | 11      | 9       | 8       | 10      | 33 %            | 10 %      |
| N7057,2E217  | 2008        | 21      | 50          | 84  | 2             | 8 | 9        | 9         | 9       | 9        | 9       | 8       | 9       | 8       | 8       | 9       | 67 %            | 6 %       |
| N7057,2E217  | 2008        | 22      | 51          | 74  | 2             | 8 | 8        | 8         | 8       | 8        | 8       | 8       | 8       | 8       | 8       | 8       | 100 %           | 0 %       |
| N7057,2E217  | 2008        | 23      | 52          | 75  | 1             | 8 | 9        | 9         | 9       | 9        | 9       | 9       | 9       | 9       | 8       | 9       | 78 %            | 5 %       |
| N7057,2E217  | 2008        | 24      | 53          | 87  | 1             | 8 | 9        | 9         | 9       | 9        | 9       | 9       | 9       | 9       | 8       | 9       | 89 %            | 4 %       |
| N7057,2E217  | 2008        | 25      | 54          | 66  | 1             | 8 | 6        | 6         | 6       | 6        | 6       | 6       | 6       | 6       | 6       | 6       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 26      | 55          | 74  | 1             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 6       | 7       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 27      | 56          | 74  | 1             | 8 | 8        | 8         | 8       | 8        | 8       | 8       | 8       | 8       | 8       | 8       | 100 %           | 0 %       |
| N7057,2E217  | 2008        | 28      | 57          | 69  | 2             | 8 | 6        | 6         | 6       | 6        | 6       | 6       | 6       | 7       | 6       | 6       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 29      | 58          | 78  | 1             | 8 | 8        | 8         | 8       | 8        | 8       | 8       | 8       | 8       | 7       | 8       | 89 %            | 4 %       |
| N7057,2E217  | 2008        | 30      | 59          | 73  | 1             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 6       | 7       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 31      | 60          | 79  | 2             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 6       | 7       | 6       | 78 %            | 7 %       |
| N7057,2E217  | 2008        | 32      | 61          | 68  | 1             | 8 | 6        | 6         | 7       | 7        | 6       | 6       | 6       | 6       | 6       | 6       | 78 %            | 7 %       |
| N7057,2E217  | 2008        | 33      | 62          | 78  | 1             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 6       | 7       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 34      | 63          | 78  | 1             | 8 | 6        | 6         | 7       | 6        | 6       | 6       | 6       | 6       | 6       | 6       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 35      | 64          | 70  | 1             | 8 | 6        | 6         | 7       | 7        | 6       | 5       | 6       | 5       | 6       | 6       | 56 %            | 12 %      |
| N7057,2E217  | 2008        | 36      | 65          | 80  | 1             | 8 | 6        | 6         | 7       | 7        | 6       | 6       | 6       | 9       | 6       | 6       | 67 %            | 15 %      |
| N7057,2E217  | 2008        | 37      | 66          | 69  | 1             | 8 | 8        | 9         | 10      | 9        | 9       | 8       | 9       | 7       | 8       | 9       | 44 %            | 10 %      |
| N7057,2E217  | 2008        | 38      | 67          | 67  | 1             | 8 | 6        | 6         | 7       | 7        | 6       | 6       | 6       | 6       | 6       | 6       | 78 %            | 7 %       |
| N7057,2E217  | 2008        | 39      | 68          | 73  | 2             | 8 | 6        | 6         | 6       | 6        | 6       | 6       | 6       | 8       | 5       | 6       | 78 %            | 13 %      |
| N7057,2E217  | 2008        | 40      | 69          | 68  | 2             | 8 | 6        | 6         | 6       | 6        | 6       | 6       | 6       | 6       | 6       | 6       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 41      | 70          | 80  | 2             | 8 | 8        | 8         | 8       | 8        | 8       | 8       | 8       | 7       | 6       | 8       | 78 %            | 9 %       |
| N7057,2E217  | 2008        | 42      | 71          | 79  | 1             | 8 | 8        | 8         | 8       | 9        | 8       | 8       | 8       | 7       | 7       | 8       | 67 %            | 8 %       |
| N7057,2E217  | 2008        | 43      | 72          | 64  | 1             | 8 | 7        | 7         | 7       | 7        | 7       | 7       | 7       | 7       | 6       | 7       | 89 %            | 5 %       |
| N7057,2E217  | 2008        | 44      | 73          | 84  | 1             | 8 | 9        | 9         | 9       | 10       | 9       | 9       | 9       | 9       | 8       | 9       | 78 %            | 6 %       |
| N7057,2E217  | 2008        | 45      | 74          | 79  | 1             | 8 | 9        | 9         | 9       | 9        | 9       | 9       | 9       | 8       | 8       | 9       | 78 %            | 5 %       |
| N7057,2E217  | 2008        | 46      | 75          | 68  | 2             | 8 | 6        | 6         | 6       | 6        | 6       | 6       | 6       | 6       | 6       | 6       | 100 %           | 0 %       |
| N6852, E1324 | 2008        | 1       | 76          | 48  | 2             | 8 | 3        | 3         | 3       | 3        | 3       | 3       | 3       | 3       | 3       | 3       | 100 %           | 0 %       |
| N6852, E1324 | 2008        | 2       | 77          | 47  | 1             | 8 | 3        | 3         | 3       | 3        | 3       | 3       | 3       | 3       | 3       | 3       | 100 %</         |           |

**Table 2** The number of age readings, the coefficient of variation (CV), the percent agreement and the RELATIVE bias are presented by MODAL age for each age reader and for all readers combined. A weighted mean CV and a weighted mean percent agreement are given by reader and all readers combined. The CV's by MODAL age for each individual age reader and all readers combined indicate the precision in age reading by MODAL age. The weighted mean CV's over all MODAL age groups comined indicate the precision in age reading by reader and for all age readers combined.

### Seilesing HI 2009, ALDER

| NUMBER OF AGE READINGS |          |           |         |          |         |         |         |         |         |       |
|------------------------|----------|-----------|---------|----------|---------|---------|---------|---------|---------|-------|
| MODAL                  | Harald S | Hildegunn | Else    | Harald L | Lisbet  | Stian   | Merete  | Jarle   | Janicke |       |
| (R1-R7)                | Leser 1  | Leser 2   | Leser 3 | Leser 4  | Leser 5 | Leser 6 | Leser 7 | Leser 8 | Leser 9 | TOTAL |
| 0                      | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| 1                      | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| 2                      | 1        | 1         | 1       | 1        | 1       | 1       | 1       | 1       | 1       | 9     |
| 3                      | 11       | 11        | 11      | 11       | 11      | 11      | 11      | 11      | 11      | 99    |
| 4                      | 11       | 11        | 11      | 11       | 11      | 11      | 11      | 11      | 11      | 99    |
| 5                      | 11       | 11        | 11      | 11       | 11      | 11      | 11      | 11      | 11      | 99    |
| 6                      | 23       | 23        | 23      | 23       | 23      | 23      | 23      | 23      | 23      | 207   |
| 7                      | 15       | 15        | 15      | 15       | 15      | 15      | 15      | 15      | 15      | 135   |
| 8                      | 11       | 11        | 11      | 11       | 11      | 11      | 11      | 11      | 11      | 99    |
| 9                      | 16       | 16        | 16      | 16       | 16      | 16      | 16      | 16      | 16      | 144   |
| 10                     | 1        | 1         | 1       | 1        | 1       | 1       | 1       | 1       | 1       | 9     |
| 11                     | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| 12                     | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| 13                     | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| 14                     | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| 15                     | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |
| Total                  | 0-15     | 100       | 100     | 100      | 100     | 100     | 100     | 100     | 100     | 900   |

| COEFFICIENT OF VARIATION (CV) |          |           |         |          |         |         |         |         |         |             |      |
|-------------------------------|----------|-----------|---------|----------|---------|---------|---------|---------|---------|-------------|------|
| MODAL                         | Harald S | Hildegunn | Else    | Harald L | Lisbet  | Stian   | Merete  | Jarle   | Janicke |             |      |
| (R1-R7)                       | Leser 1  | Leser 2   | Leser 3 | Leser 4  | Leser 5 | Leser 6 | Leser 7 | Leser 8 | Leser 9 | ALL Readers |      |
| 0                             | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 1                             | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 2                             | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 3                             | 0%       | 0%        | 0%      | 0%       | 0%      | 0%      | 0%      | 10%     | 0%      | 1.0%        |      |
| 4                             | 0%       | 0%        | 0%      | 0%       | 0%      | 0%      | 11%     | 10%     | 11%     | 3.8%        |      |
| 5                             | 0%       | 6%        | 6%      | 0%       | 8%      | 0%      | 9%      | 6%      | 0%      | 3.4%        |      |
| 6                             | 0%       | 4%        | 8%      | 10%      | 4%      | 4%      | 9%      | 16%     | 7%      | 7.6%        |      |
| 7                             | 0%       | 4%        | 4%      | 0%       | 5%      | 5%      | 8%      | 5%      | 8%      | 4.7%        |      |
| 8                             | 0%       | 5%        | 7%      | 4%       | 0%      | 0%      | 5%      | 9%      | 9%      | 4.5%        |      |
| 9                             | 4%       | 3%        | 4%      | 5%       | 4%      | 4%      | 5%      | 7%      | 8%      | 5.7%        |      |
| 10                            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 11                            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 12                            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 13                            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 14                            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| 15                            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -           |      |
| Weighted mean                 | 0-15     | 0.6%      | 2.5%    | 4.3%     | 3.8%    | 3.5%    | 2.2%    | 6.9%    | 9.5%    | 6.4%        | 4.9% |
|                               | RANKING  | 1         | 3       | 6        | 5       | 4       | 2       | 8       | 9       | 7           |      |

| PERCENTAGE AGREEMENT |          |           |         |          |         |         |         |         |         |       |       |
|----------------------|----------|-----------|---------|----------|---------|---------|---------|---------|---------|-------|-------|
| MODAL                | Harald S | Hildegunn | Else    | Harald L | Lisbet  | Stian   | Merete  | Jarle   | Janicke |       |       |
| (R1-R7)              | Leser 1  | Leser 2   | Leser 3 | Leser 4  | Leser 5 | Leser 6 | Leser 7 | Leser 8 | Leser 9 | ALL   |       |
| 0                    | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| 1                    | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| 2                    | 100%     | 100%      | 100%    | 100%     | 100%    | 100%    | 100%    | 100%    | 100%    | 100%  |       |
| 3                    | 100%     | 100%      | 100%    | 100%     | 100%    | 100%    | 100%    | 91%     | 100%    | 99%   |       |
| 4                    | 100%     | 100%      | 100%    | 100%     | 100%    | 100%    | 73%     | 82%     | 82%     | 93%   |       |
| 5                    | 100%     | 91%       | 91%     | 100%     | 82%     | 100%    | 73%     | 91%     | 100%    | 92%   |       |
| 6                    | 100%     | 96%       | 52%     | 52%      | 96%     | 96%     | 65%     | 61%     | 83%     | 78%   |       |
| 7                    | 100%     | 93%       | 93%     | 100%     | 87%     | 87%     | 67%     | 87%     | 47%     | 84%   |       |
| 8                    | 100%     | 100%      | 82%     | 73%      | 91%     | 100%    | 82%     | 55%     | 55%     | 82%   |       |
| 9                    | 88%      | 94%       | 81%     | 75%      | 88%     | 88%     | 69%     | 56%     | 19%     | 73%   |       |
| 10                   | 100%     | 100%      | 0%      | 0%       | 0%      | 100%    | 0%      | 0%      | 0%      | 33%   |       |
| 11                   | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| 12                   | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| 13                   | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| 14                   | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| 15                   | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |       |
| Weighted mean        | 0-15     | 98.0%     | 96.0%   | 81.0%    | 81.0%   | 91.0%   | 95.0%   | 73.0%   | 72.0%   | 67.0% | 83.8% |
|                      | RANKING  | 1         | 2       | 5        | 5       | 4       | 3       | 7       | 8       | 9     |       |

| RELATIVE BIAS |          |           |         |          |         |         |         |         |         |       |      |
|---------------|----------|-----------|---------|----------|---------|---------|---------|---------|---------|-------|------|
| MODAL         | Harald S | Hildegunn | Else    | Harald L | Lisbet  | Stian   | Merete  | Jarle   | Janicke |       |      |
| (R1-R7)       | Leser 1  | Leser 2   | Leser 3 | Leser 4  | Leser 5 | Leser 6 | Leser 7 | Leser 8 | Leser 9 | ALL   |      |
| 0             | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| 1             | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| 2             | 0.00     | 0.00      | 0.00    | 0.00     | 0.00    | 0.00    | 0.00    | 0.00    | 0.00    | 0.00  |      |
| 3             | 0.00     | 0.00      | 0.00    | 0.00     | 0.00    | 0.00    | 0.00    | 0.09    | 0.00    | 0.01  |      |
| 4             | 0.00     | 0.00      | 0.00    | 0.00     | 0.00    | 0.00    | 0.27    | 0.18    | 0.00    | 0.05  |      |
| 5             | 0.00     | 0.09      | -0.09   | 0.00     | 0.18    | 0.00    | 0.27    | 0.09    | 0.00    | 0.06  |      |
| 6             | 0.00     | -0.04     | 0.48    | 0.30     | -0.04   | -0.04   | 0.39    | 0.35    | -0.09   | 0.14  |      |
| 7             | 0.00     | -0.07     | -0.07   | 0.00     | 0.00    | 0.00    | 0.07    | 0.00    | -0.53   | -0.07 |      |
| 8             | 0.00     | 0.00      | -0.18   | 0.09     | -0.09   | 0.00    | 0.18    | -0.09   | -0.55   | -0.07 |      |
| 9             | -0.13    | -0.06     | 0.19    | 0.25     | 0.00    | -0.13   | 0.31    | -0.50   | -0.94   | -0.11 |      |
| 10            | 0.00     | 0.00      | 1.00    | 1.00     | 1.00    | 0.00    | 1.00    | -1.00   | -2.00   | 0.11  |      |
| 11            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| 12            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| 13            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| 14            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| 15            | -        | -         | -       | -        | -       | -       | -       | -       | -       | -     |      |
| Weighted mean | 0-15     | -0.02     | -0.02   | 0.11     | 0.13    | 0.01    | -0.03   | 0.24    | 0.02    | -0.33 | 0.01 |
|               | RANKING  | 3         | 4       | 6        | 7       | 1       | 5       | 8       | 2       | 9     |      |

| Overall ranking                  |          |           |         |          |         |         |         |         |         |
|----------------------------------|----------|-----------|---------|----------|---------|---------|---------|---------|---------|
|                                  | Harald S | Hildegunn | Else    | Harald L | Lisbet  | Stian   | Merete  | Jarle   | Janicke |
|                                  | Leser 1  | Leser 2   | Leser 3 | Leser 4  | Leser 5 | Leser 6 | Leser 7 | Leser 8 | Leser 9 |
| Ranking Coefficient of Variation | 1        | 3         | 6       | 5        | 4       | 2       | 8       | 9       | 7       |
| Ranking Percentage Agreement     | 1        | 2         | 5       | 5        | 4       | 3       | 7       | 8       | 9       |
| Ranking relative bias            | 3        | 4         | 6       | 7        | 1       | 5       | 8       | 2       | 9       |
| OVERALL RANKING                  | 1        | 2         | 5       | 5        | 2       | 4       | 8       | 7       | 9       |

# Seilesing HI 2009, ALDER

**Table 3** Upper table: The age compositions estimated by each age reader and all age readers combined.  
Middle table: The estimated mean length at age by age reader and by all age readers combined.  
Lower table: Bias tests: non-parametrically with a one-sample Wilcoxon rank sum test. The inter-reader bias test and the reader against MODAL age bias test.

| AGE COMPOSITION |                     |                      |                 |                     |                   |                  |                   |                  |                    |       |
|-----------------|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|-------|
| Age             | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 | TOTAL |
| 0               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 1               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 2               | 1                   | 1                    | 1               | 1                   | 1                 | 1                | 1                 | 1                | 1                  | 9     |
| 3               | 11                  | 11                   | 11              | 11                  | 11                | 11               | 11                | 10               | 12                 | 99    |
| 4               | 11                  | 11                   | 12              | 11                  | 11                | 11               | 8                 | 11               | 9                  | 95    |
| 5               | 11                  | 11                   | 10              | 13                  | 10                | 12               | 11                | 13               | 15                 | 106   |
| 6               | 23                  | 24                   | 13              | 12                  | 25                | 23               | 20                | 16               | 29                 | 185   |
| 7               | 15                  | 14                   | 27              | 25                  | 14                | 13               | 17                | 21               | 12                 | 158   |
| 8               | 13                  | 12                   | 9               | 8                   | 12                | 14               | 13                | 15               | 19                 | 115   |
| 9               | 14                  | 15                   | 13              | 14                  | 14                | 14               | 13                | 13               | 3                  | 113   |
| 10              | 1                   | 1                    | 3               | 4                   | 1                 | 1                | 5                 | -                | -                  | 16    |
| 11              | -                   | -                    | 1               | 1                   | 1                 | -                | 1                 | -                | -                  | 4     |
| 12              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 13              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 14              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 15              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 16              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 17              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 18              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 19              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 20              | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| Total           | 0-15                | 100                  | 100             | 100                 | 100               | 100              | 100               | 100              | 100                | 900   |

| MEAN LENGTH AT AGE |                     |                      |                 |                     |                   |                  |                   |                  |                    |      |
|--------------------|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|------|
| Age                | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 | ALL  |
| 0                  | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 1                  | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 2                  | 40.0                | 40.0                 | 40.0            | 40.0                | 40.0              | 40.0             | 40.0              | 40.0             | 40.0               | 40.0 |
| 3                  | 46.1                | 46.1                 | 46.1            | 46.1                | 46.1              | 46.1             | 46.1              | 45.5             | 46.3               | 46.1 |
| 4                  | 49.8                | 49.8                 | 51.3            | 49.8                | 49.8              | 49.8             | 48.4              | 49.7             | 49.6               | 49.9 |
| 5                  | 56.6                | 57.3                 | 55.5            | 57.1                | 57.6              | 57.8             | 56.4              | 57.3             | 57.8               | 57.1 |
| 6                  | 67.3                | 67.1                 | 64.6            | 66.8                | 66.2              | 66.7             | 66.1              | 64.9             | 70.3               | 67.0 |
| 7                  | 68.7                | 68.6                 | 69.0            | 68.7                | 70.7              | 70.2             | 66.5              | 69.2             | 67.3               | 68.8 |
| 8                  | 75.9                | 77.0                 | 79.6            | 76.6                | 74.8              | 75.4             | 73.7              | 76.3             | 78.6               | 76.4 |
| 9                  | 79.9                | 78.8                 | 78.8            | 79.1                | 78.8              | 79.4             | 79.3              | 81.6             | 78.3               | 79.4 |
| 10                 | 84.0                | 84.0                 | 80.0            | 81.5                | 85.0              | 84.0             | 81.4              | -                | -                  | 81.9 |
| 11                 | -                   | -                    | 84.0            | 84.0                | 84.0              | -                | 84.0              | -                | -                  | 84.0 |
| 12                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 13                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 14                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 15                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 16                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 17                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 18                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 19                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| 20                 | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -    |
| Weighted mean      | 0-15                | 64.9                 | 64.9            | 64.9                | 64.9              | 64.9             | 64.9              | 64.9             | 64.9               | 64.9 |

| Inter-reader bias test and reader against MODAL age bias test |                     |                      |                 |                     |                   |                  |                   |                  |                    |  |
|---|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|--|
|   | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 |  |
| Leser 1   | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  |  |
| Leser 2   | *                   | *                    | -               | -                   | -                 | -                | -                 | -                | -                  |  |
| Leser 3   | **                  | **                   | -               | *                   | -                 | -                | -                 | -                | -                  |  |
| Leser 4   | -                   | -                    | -               | *                   | -                 | -                | -                 | -                | -                  |  |
| Leser 5   | -                   | -                    | *               | **                  | -                 | -                | -                 | -                | -                  |  |
| Leser 6   | **                  | **                   | *               | *                   | **                | **               | -                 | -                | -                  |  |
| Leser 7   | -                   | -                    | -               | -                   | -                 | -                | *                 | -                | -                  |  |
| Leser 8   | **                  | **                   | **              | **                  | **                | **               | **                | **               | -                  |  |
| Leser 9   | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  |  |
| MODAL (R1-R7)   | -                   | -                    | *               | **                  | -                 | -                | **                | -                | **                 |  |

|    |                                     |
|----|-------------------------------------|
| -  | = no sign of bias (p>0.05)          |
| *  | = possibility of bias (0.01<p<0.05) |
| ** | = certainty of bias (p<0.01)        |

## Seilesing HI 2009, ALDER

**Table 4** Otoliths read, CV's, percentage agreement and RELATIVE bias by month and by MODAL age.

| NUMBER OF OTOLITHS |          |          |          |          |          |          |          |          |          |           |           |           |                   |
|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-------------------|
| MODAL<br>(R1-R7)   | 1<br>Jan | 2<br>Feb | 3<br>Mar | 4<br>Apr | 5<br>May | 6<br>Jun | 7<br>Jul | 8<br>Aug | 9<br>Sep | 10<br>Oct | 11<br>Nov | 12<br>Dec | Nr of<br>otoliths |
| 0                  | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| 1                  | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| 2                  | -        | -        | -        | -        | -        | -        | -        | 1        | -        | -         | -         | -         | 1                 |
| 3                  | -        | -        | -        | -        | -        | -        | -        | 11       | -        | -         | -         | -         | 11                |
| 4                  | -        | 9        | -        | -        | -        | -        | -        | 2        | -        | -         | -         | -         | 11                |
| 5                  | -        | 4        | -        | -        | -        | -        | -        | 5        | -        | -         | -         | -         | 11                |
| 6                  | -        | 4        | -        | -        | -        | -        | -        | 19       | -        | -         | -         | -         | 23                |
| 7                  | -        | 6        | -        | -        | -        | -        | -        | 9        | -        | -         | -         | -         | 15                |
| 8                  | -        | 3        | -        | -        | -        | -        | -        | 8        | -        | -         | -         | -         | 11                |
| 9                  | -        | 1        | -        | -        | -        | -        | -        | 15       | -        | -         | -         | -         | 16                |
| 10                 | -        | -        | -        | -        | -        | -        | -        | 1        | -        | -         | -         | -         | 1                 |
| 11                 | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| 12                 | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| 13                 | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| 14                 | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| 15                 | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | 0                 |
| TOTAL              | 0        | 29       | 0        | 0        | 0        | 0        | 0        | 71       | 0        | 0         | 0         | 0         | 100               |

| COEFFICIENT OF VARIATION (CV) |          |          |          |          |          |          |          |          |          |           |           |           |            |
|-------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|------------|
| MODAL<br>(R1-R7)              | 1<br>Jan | 2<br>Feb | 3<br>Mar | 4<br>Apr | 5<br>May | 6<br>Jun | 7<br>Jul | 8<br>Aug | 9<br>Sep | 10<br>Oct | 11<br>Nov | 12<br>Dec | Mean<br>CV |
| 0                             | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| 1                             | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| 2                             | -        | -        | -        | -        | -        | -        | -        | 0 %      | -        | -         | -         | -         | -          |
| 3                             | -        | -        | -        | -        | -        | -        | -        | 1 %      | -        | -         | -         | -         | 1.0%       |
| 4                             | -        | 5 %      | -        | -        | -        | -        | -        | 0 %      | -        | -         | -         | -         | 3.8%       |
| 5                             | -        | 1 %      | -        | -        | -        | -        | -        | 6 %      | -        | -         | -         | -         | 3.4%       |
| 6                             | -        | 7 %      | -        | -        | -        | -        | -        | 8 %      | -        | -         | -         | -         | 7.6%       |
| 7                             | -        | 4 %      | -        | -        | -        | -        | -        | 5 %      | -        | -         | -         | -         | 4.7%       |
| 8                             | -        | 4 %      | -        | -        | -        | -        | -        | 5 %      | -        | -         | -         | -         | 4.5%       |
| 9                             | -        | 0 %      | -        | -        | -        | -        | -        | 6 %      | -        | -         | -         | -         | 5.7%       |
| 10                            | -        | -        | -        | -        | -        | -        | -        | 10 %     | -        | -         | -         | -         | -          |
| 11                            | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| 12                            | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| 13                            | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| 14                            | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| 15                            | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -          |
| Mean CV                       | -        | 3.8%     | -        | -        | -        | -        | -        | 5.3%     | -        | -         | -         | -         | 4.8%       |

Note: Higher CV's might be expected during months of opaque material deposition and during the juvenile phase, when false rings might occur!

| PERCENTAGE AGREEMENT |          |          |          |          |          |          |          |          |          |           |           |           |                |
|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|----------------|
| MODAL<br>(R1-R7)     | 1<br>Jan | 2<br>Feb | 3<br>Mar | 4<br>Apr | 5<br>May | 6<br>Jun | 7<br>Jul | 8<br>Aug | 9<br>Sep | 10<br>Oct | 11<br>Nov | 12<br>Dec | Agree-<br>ment |
| 0                    | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| 1                    | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| 2                    | -        | -        | -        | -        | -        | -        | -        | 100 %    | -        | -         | -         | -         | 100.0%         |
| 3                    | -        | -        | -        | -        | -        | -        | -        | 99 %     | -        | -         | -         | -         | 99.0%          |
| 4                    | -        | 91 %     | -        | -        | -        | -        | -        | 100 %    | -        | -         | -         | -         | 92.9%          |
| 5                    | -        | 98 %     | -        | -        | -        | -        | -        | 84 %     | -        | -         | -         | -         | 91.9%          |
| 6                    | -        | 75 %     | -        | -        | -        | -        | -        | 78 %     | -        | -         | -         | -         | 77.8%          |
| 7                    | -        | 83 %     | -        | -        | -        | -        | -        | 85 %     | -        | -         | -         | -         | 84.4%          |
| 8                    | -        | 81 %     | -        | -        | -        | -        | -        | 82 %     | -        | -         | -         | -         | 81.8%          |
| 9                    | -        | 100 %    | -        | -        | -        | -        | -        | 71 %     | -        | -         | -         | -         | 72.9%          |
| 10                   | -        | -        | -        | -        | -        | -        | -        | 33 %     | -        | -         | -         | -         | 33.3%          |
| 11                   | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| 12                   | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| 13                   | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| 14                   | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| 15                   | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -              |
| Mean                 | -        | 88.1%    | -        | -        | -        | -        | -        | 82.0%    | -        | -         | -         | -         | 83.8%          |

Weighted

| RELATIVE BIAS    |          |          |          |          |          |          |          |          |          |           |           |           |              |
|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|--------------|
| MODAL<br>(R1-R7) | 1<br>Jan | 2<br>Feb | 3<br>Mar | 4<br>Apr | 5<br>May | 6<br>Jun | 7<br>Jul | 8<br>Aug | 9<br>Sep | 10<br>Oct | 11<br>Nov | 12<br>Dec | Mean<br>bias |
| 0                | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| 1                | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| 2                | -        | -        | -        | -        | -        | -        | -        | 0.00     | -        | -         | -         | -         | 0.00         |
| 3                | -        | -        | -        | -        | -        | -        | -        | 0.01     | -        | -         | -         | -         | 0.01         |
| 4                | -        | 0.06     | -        | -        | -        | -        | -        | 0.00     | -        | -         | -         | -         | 0.05         |
| 5                | -        | 0.02     | -        | -        | -        | -        | -        | 0.11     | -        | -         | -         | -         | 0.06         |
| 6                | -        | 0.08     | -        | -        | -        | -        | -        | 0.16     | -        | -         | -         | -         | 0.14         |
| 7                | -        | -0.02    | -        | -        | -        | -        | -        | -0.10    | -        | -         | -         | -         | -0.07        |
| 8                | -        | -0.19    | -        | -        | -        | -        | -        | -0.03    | -        | -         | -         | -         | -0.07        |
| 9                | -        | 0.00     | -        | -        | -        | -        | -        | -0.12    | -        | -         | -         | -         | -0.11        |
| 10               | -        | -        | -        | -        | -        | -        | -        | 0.11     | -        | -         | -         | -         | 0.11         |
| 11               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| 12               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| 13               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| 14               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| 15               | -        | -        | -        | -        | -        | -        | -        | -        | -        | -         | -         | -         | -            |
| Mean             | -        | 0.01     | -        | -        | -        | -        | -        | 0.01     | -        | -         | -         | -         | 0.01         |

Weighted

# Seilesing HI 2009, ALDER

**Table 5** Otoliths read, CV's, percentage agreement and RELATIVE bias by stratum and MODAL age.

| NUMBER OF OTOLITHS |                 |              |              |              |   |   |   |   |   |   |   |   | Nr of<br>otoliths |
|--------------------|-----------------|--------------|--------------|--------------|---|---|---|---|---|---|---|---|-------------------|
| MODAL<br>(R1-R7)   | SAMPLING STRATA |              |              |              |   |   |   |   |   |   |   |   |                   |
|                    | N6103, E0222    | N6046, E0047 | N7057, 2E217 | N6852, E1324 | E | F | G | H | I | J | K | L |                   |
| 0                  | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| 1                  | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| 2                  | -               | -            | -            | 1            | - | - | - | - | - | - | - | - | 1                 |
| 3                  | -               | -            | -            | 11           | - | - | - | - | - | - | - | - | 11                |
| 4                  | 7               | 2            | -            | 2            | - | - | - | - | - | - | - | - | 11                |
| 5                  | 5               | 1            | -            | 5            | - | - | - | - | - | - | - | - | 11                |
| 6                  | 3               | 1            | 15           | 4            | - | - | - | - | - | - | - | - | 23                |
| 7                  | 6               | -            | 8            | 1            | - | - | - | - | - | - | - | - | 15                |
| 8                  | 3               | -            | 8            | -            | - | - | - | - | - | - | - | - | 11                |
| 9                  | 1               | -            | 14           | 1            | - | - | - | - | - | - | - | - | 16                |
| 10                 | -               | -            | 1            | -            | - | - | - | - | - | - | - | - | 1                 |
| 11                 | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| 12                 | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| 13                 | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| 14                 | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| 15                 | -               | -            | -            | -            | - | - | - | - | - | - | - | - | 0                 |
| TOTAL              | 25              | 4            | 46           | 25           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100               |

| COEFFICIENT OF VARIATION (CV) |  |      |      |      | SAMPLING STRATA |   |   |   |   |   |      |  | Mean CV |
|-------------------------------|--|------|------|------|-----------------|---|---|---|---|---|------|--|---------|
| MODAL (R1-R7)                 | 6103, E0226046, E0047057, 2E216852, E132 | E    | F    | G    | H               | I | J | K | L |   |      |  |         |
| 0                             | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| 1                             | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| 2                             | -  | -    | -    | 0 %  | -               | - | - | - | - | - | -    |  |         |
| 3                             | -  | -    | -    | 1 %  | -               | - | - | - | - | - | 1.0% |  |         |
| 4                             | 5 %                                      | 4 %  | -    | 0 %  | -               | - | - | - | - | - | 3.8% |  |         |
| 5                             | 0 %                                      | 7 %  | -    | 6 %  | -               | - | - | - | - | - | 3.4% |  |         |
| 6                             | 8 %                                      | 5 %  | 8 %  | 7 %  | -               | - | - | - | - | - | 7.6% |  |         |
| 7                             | 4 %                                      | -    | 5 %  | 7 %  | -               | - | - | - | - | - | 4.7% |  |         |
| 8                             | 4 %                                      | -    | 5 %  | -    | -               | - | - | - | - | - | 4.5% |  |         |
| 9                             | 0 %                                      | -    | 6 %  | 4 %  | -               | - | - | - | - | - | 5.7% |  |         |
| 10                            | -  | -    | 10 % | -    | -               | - | - | - | - | - | -    |  |         |
| 11                            | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| 12                            | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| 13                            | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| 14                            | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| 15                            | -  | -    | -    | -    | -               | - | - | - | - | - | -    |  |         |
| Mean CV                       | 3.7%                                     | 5.0% | 6.4% | 3.2% | -               | - | - | - | - | - | 4.8% |  |         |

| PERCENTAGE AGREEMENT |  |       |       | SAMPLING STRATA |   |   |   |   |   |   |        | Agreement |
|----------------------|--|-------|-------|-----------------|---|---|---|---|---|---|--------|-----------|
| MODAL (R1-R7)        | 6103, E0226046, E0047057, 2E216852, E132 | E     | F     | G               | H | I | J | K | L |   |        |           |
| 0                    | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| 1                    | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| 2                    | -  | -     | -     | 100 %           | - | - | - | - | - | - | 100.0% |           |
| 3                    | -  | -     | -     | 99 %            | - | - | - | - | - | - | 99.0%  |           |
| 4                    | 90 %                                     | 94 %  | -     | 100 %           | - | - | - | - | - | - | 92.9%  |           |
| 5                    | 100 %                                    | 89 %  | -     | 84 %            | - | - | - | - | - | - | 91.9%  |           |
| 6                    | 70 %                                     | 89 %  | 77 %  | 83 %            | - | - | - | - | - | - | 77.8%  |           |
| 7                    | 83 %                                     | -     | 86 %  | 78 %            | - | - | - | - | - | - | 84.4%  |           |
| 8                    | 81 %                                     | -     | 82 %  | -               | - | - | - | - | - | - | 81.8%  |           |
| 9                    | 100 %                                    | -     | 70 %  | 89 %            | - | - | - | - | - | - | 72.9%  |           |
| 10                   | -  | -     | 33 %  | -               | - | - | - | - | - | - | 33.3%  |           |
| 11                   | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| 12                   | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| 13                   | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| 14                   | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| 15                   | -  | -     | -     | -               | - | - | - | - | - | - | -      |           |
| Mean CV              | 87.6%                                    | 91.7% | 76.3% | 92.4%           | - | - | - | - | - | - | 83.8%  |           |

| RELATIVE BIAS    |  |      |       |       |   |   |   |   |   |   |       |              |  |
|------------------|--|------|-------|-------|---|---|---|---|---|---|-------|--------------|--|
| MODAL<br>(R1-R7) | SAMPLING STRATA                          |      |       |       |   |   |   |   |   |   |       | Mean<br>bias |  |
|                  | 6103, E0226046, E0047057, 2E216852, E132 | E    | F     | G     | H | I | J | K | L |   |       |              |  |
| 0                | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| 1                | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| 2                | -  | -    | -     | 0.00  | - | - | - | - | - | - | 0.00  |              |  |
| 3                | -  | -    | -     | 0.01  | - | - | - | - | - | - | 0.01  |              |  |
| 4                | 0.06                                     | 0.06 | -     | 0.00  | - | - | - | - | - | - | 0.05  |              |  |
| 5                | 0.00                                     | 0.11 | -     | 0.11  | - | - | - | - | - | - | 0.06  |              |  |
| 6                | 0.07                                     | 0.11 | 0.22  | -0.08 | - | - | - | - | - | - | 0.14  |              |  |
| 7                | -0.02                                    | -    | -0.08 | -0.22 | - | - | - | - | - | - | -0.07 |              |  |
| 8                | -0.19                                    | -    | -0.03 | -     | - | - | - | - | - | - | -0.07 |              |  |
| 9                | 0.00                                     | -    | -0.12 | -0.11 | - | - | - | - | - | - | -0.11 |              |  |
| 10               | -  | -    | 0.11  | -     | - | - | - | - | - | - | 0.11  |              |  |
| 11               | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| 12               | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| 13               | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| 14               | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| 15               | -  | -    | -     | -     | - | - | - | - | - | - | -     |              |  |
| Mean             | 0.00                                     | 0.08 | 0.02  | -0.00 | - | - | - | - | - | - | 0.01  |              |  |

**Table 6**                      **TABLES FOR PLOTTING THE AGE BIAS PLOT FIGURES OF FIGUR**  
**Seilesing HI 2009, ALDER**

| 2STDEV           |                     |                      |                 |                     |                   |                  |                   |                  |                    |               |
|------------------|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|---------------|
| MODAL<br>(R1-R7) | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 | 2STDEV<br>ALL |
| 0                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |
| 1                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |
| 2                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | 0.000         |
| 3                | 0.000               | 0.000                | 0.000           | 0.000               | 0.000             | 0.000            | 0.000             | 0.603            | 0.000              | 0.201         |
| 4                | 0.000               | 0.000                | 0.000           | 0.000               | 0.000             | 0.000            | 0.934             | 0.809            | 0.894              | 0.525         |
| 5                | 0.000               | 0.603                | 0.603           | 0.000               | 0.809             | 0.000            | 0.934             | 0.603            | 0.000              | 0.558         |
| 6                | 0.000               | 0.417                | 1.022           | 1.270               | 0.417             | 0.417            | 1.166             | 2.055            | 0.834              | 1.094         |
| 7                | 0.000               | 0.516                | 0.516           | 0.000               | 0.756             | 0.756            | 1.187             | 0.756            | 1.033              | 0.780         |
| 8                | 0.000               | 0.000                | 0.809           | 1.079               | 0.603             | 0.000            | 0.809             | 1.401            | 1.375              | 0.915         |
| 9                | 0.683               | 0.500                | 0.806           | 0.894               | 0.730             | 0.683            | 0.957             | 1.265            | 1.360              | 1.161         |
| 10               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | 2.108         |
| 11               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |
| 12               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |
| 13               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |
| 14               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |
| 15               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -             |

| MEAN AGE         |                     |                      |                 |                     |                   |                  |                   |                  |                    |       |      |
|------------------|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|-------|------|
| MODAL<br>(R1-R7) | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 | ALL   |      |
| 0                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| 1                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| 2                | 2.00                | 2.00                 | 2.00            | 2.00                | 2.00              | 2.00             | 2.00              | 2.00             | 2.00               | 2.00  |      |
| 3                | 3.00                | 3.00                 | 3.00            | 3.00                | 3.00              | 3.00             | 3.00              | 3.09             | 3.00               | 3.01  |      |
| 4                | 4.00                | 4.00                 | 4.00            | 4.00                | 4.00              | 4.00             | 4.27              | 4.18             | 4.00               | 4.05  |      |
| 5                | 5.00                | 5.09                 | 4.91            | 5.00                | 5.18              | 5.00             | 5.27              | 5.09             | 5.00               | 5.06  |      |
| 6                | 6.00                | 5.96                 | 6.48            | 6.30                | 5.96              | 5.96             | 6.39              | 6.35             | 5.91               | 6.14  |      |
| 7                | 7.00                | 6.93                 | 6.93            | 7.00                | 7.00              | 7.00             | 7.07              | 7.00             | 6.47               | 6.93  |      |
| 8                | 8.00                | 8.00                 | 7.82            | 8.09                | 7.91              | 8.00             | 8.18              | 7.91             | 7.45               | 7.93  |      |
| 9                | 8.88                | 8.94                 | 9.19            | 9.25                | 9.00              | 8.88             | 9.31              | 8.50             | 8.06               | 8.89  |      |
| 10               | 10.00               | 10.00                | 11.00           | 11.00               | 11.00             | 10.00            | 11.00             | 9.00             | 8.00               | 10.11 |      |
| 11               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| 12               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| 13               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| 14               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| 15               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |      |
| Weighted mean    | 0-15                | 6.17                 | 6.17            | 6.30                | 6.32              | 6.20             | 6.16              | 6.43             | 6.21               | 5.86  | 6.20 |

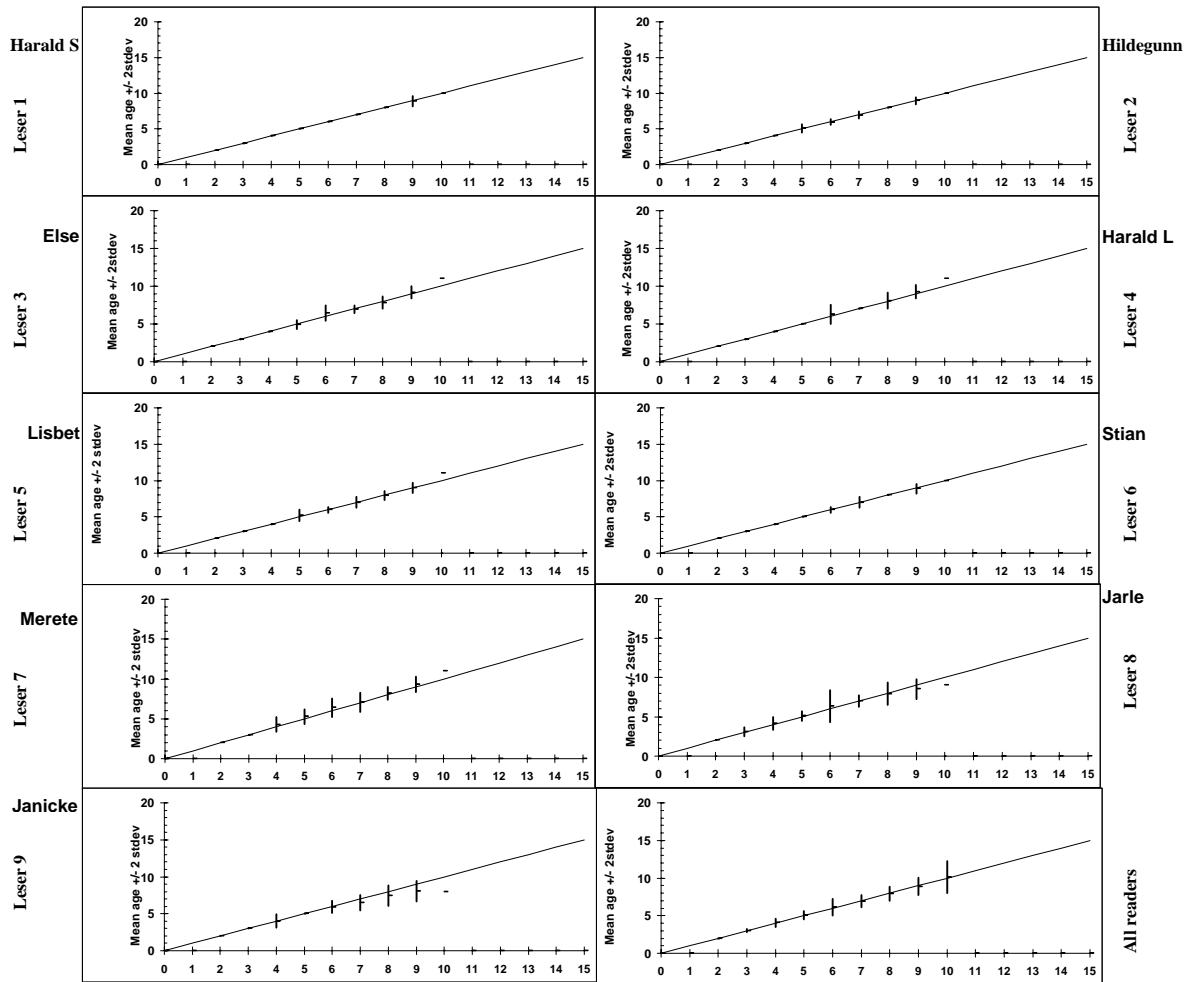
| MEAN AGE +2STDEV |                     |                      |                 |                     |                   |                  |                   |                  |                    |       |
|------------------|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|-------|
| MODAL<br>(R1-R7) | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 | ALL   |
| 0                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 1                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 2                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | 2.00  |
| 3                | 3.000               | 3.000                | 3.000           | 3.000               | 3.000             | 3.000            | 3.000             | 3.694            | 3.000              | 3.21  |
| 4                | 4.000               | 4.000                | 4.000           | 4.000               | 4.000             | 4.000            | 5.207             | 4.991            | 4.894              | 4.58  |
| 5                | 5.000               | 5.694                | 5.512           | 5.000               | 5.991             | 5.000            | 6.207             | 5.694            | 5.000              | 5.62  |
| 6                | 6.000               | 6.374                | 7.500           | 7.574               | 6.374             | 6.374            | 7.557             | 8.402            | 6.747              | 7.24  |
| 7                | 7.000               | 7.450                | 7.450           | 7.000               | 7.756             | 7.756            | 8.254             | 7.756            | 7.499              | 7.71  |
| 8                | 8.000               | 8.000                | 8.627           | 9.170               | 8.512             | 8.000            | 8.991             | 9.310            | 8.830              | 8.84  |
| 9                | 9.558               | 9.438                | 9.994           | 10.144              | 9.730             | 9.558            | 10.270            | 9.765            | 9.423              | 10.05 |
| 10               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | 12.22 |
| 11               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 12               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 13               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 14               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 15               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |

| MEAN AGE -2STDEV |                     |                      |                 |                     |                   |                  |                   |                  |                    |       |
|------------------|---------------------|----------------------|-----------------|---------------------|-------------------|------------------|-------------------|------------------|--------------------|-------|
| MODAL<br>(R1-R7) | Harald S<br>Leser 1 | Hildegunn<br>Leser 2 | Eise<br>Leser 3 | Harald L<br>Leser 4 | Lisbet<br>Leser 5 | Stian<br>Leser 6 | Merete<br>Leser 7 | Jarle<br>Leser 8 | Janicke<br>Leser 9 | ALL   |
| 0                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 1                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 2                | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | 2.000 |
| 3                | 3.000               | 3.000                | 3.000           | 3.000               | 3.000             | 3.000            | 3.000             | 2.488            | 3.000              | 2.809 |
| 4                | 4.000               | 4.000                | 4.000           | 4.000               | 4.000             | 4.000            | 3.339             | 3.373            | 3.106              | 3.526 |
| 5                | 5.000               | 4.488                | 4.306           | 5.000               | 4.373             | 5.000            | 4.339             | 4.488            | 5.000              | 4.502 |
| 6                | 6.000               | 5.539                | 5.457           | 5.034               | 5.539             | 5.539            | 5.225             | 4.293            | 5.079              | 5.051 |
| 7                | 7.000               | 6.417                | 6.417           | 7.000               | 6.244             | 6.244            | 5.879             | 6.244            | 5.434              | 6.153 |
| 8                | 8.000               | 8.000                | 7.009           | 7.012               | 7.306             | 8.000            | 7.373             | 6.508            | 6.079              | 7.014 |
| 9                | 8.192               | 8.438                | 8.381           | 8.356               | 8.270             | 8.192            | 8.355             | 7.235            | 6.702              | 7.727 |
| 10               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | 8.003 |
| 11               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 12               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 13               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 14               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |
| 15               | -                   | -                    | -               | -                   | -                 | -                | -                 | -                | -                  | -     |

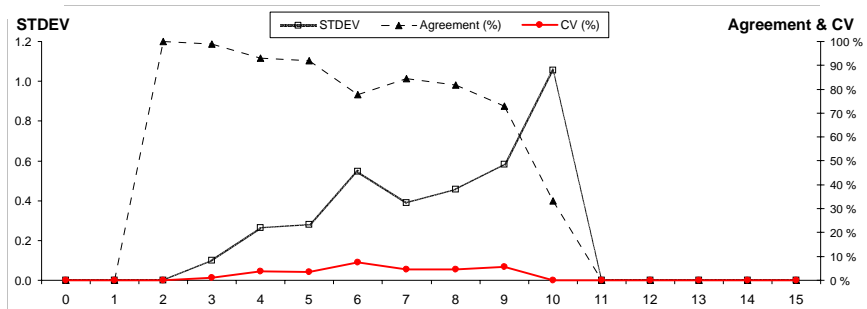
| Table 7 Agreed collection |    |
|---------------------------|----|
| Criterion 80% agreement   |    |
| MODAL AGE                 | n  |
| 0                         | 0  |
| 1                         | 0  |
| 2                         | 1  |
| 3                         | 11 |
| 4                         | 8  |
| 5                         | 9  |
| 6                         | 9  |
| 7                         | 8  |
| 8                         | 6  |
| 9                         | 5  |
| 10                        | 0  |
| 11                        | 0  |
| 12                        | 0  |
| 13                        | 0  |
| 14                        | 0  |
| 15                        | 0  |
| 16                        | 0  |
| 17                        | 0  |
| 18                        | 0  |
| 19                        | 0  |
| 20                        | 0  |
|                           | 57 |

Seilesing HI 2009, ALDER

**Figure 1** In the age bias plots below the mean age recorded +/- 2stdev of each age reader and all readers combined are plotted against the MODAL age. The estimated mean age corresponds to MODAL age, if the estimated mean age is on the 1:1 equilibrium line (solid line). RELATIVE bias is the age difference between estimated mean age and MODAL age.

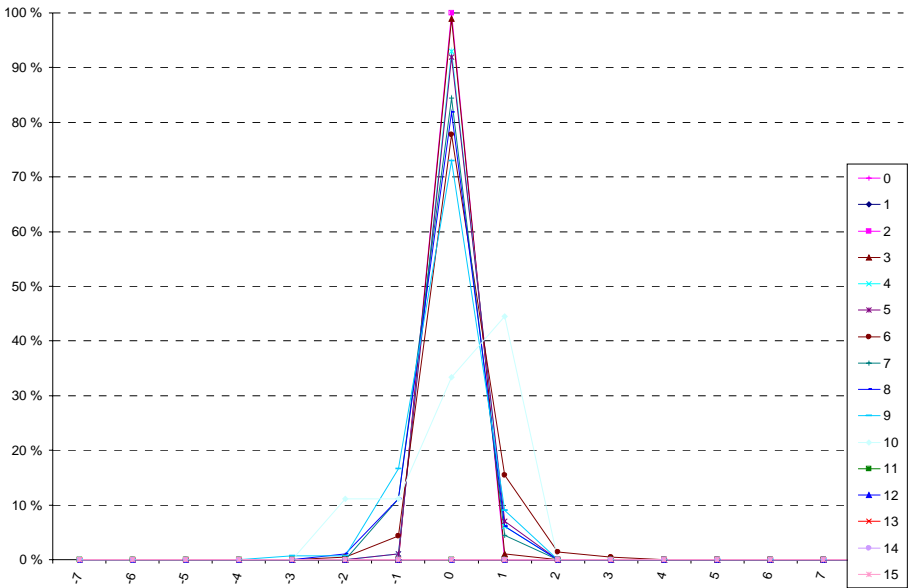






**Figure 2** The coefficient of variation (CV%), percent agreement and the standard deviation (STDEV) are plotted against MODAL age. CV is much less age dependent than the standard deviation (STDEV) and the percent agreement. CV is therefore a better index for the precision in age reading. Problems in age reading are indicated by relatively high CV's at age.

Seilesing HI 2009, ALDER



**Figure 3** The distribution of the age reading errors in percentage by MODAL age as observed from the whole group of age readers in an age reading comparison to MODAL age. The achieved precision in age reading by MODAL age group is shown by the spread of the age readings errors. There appears to be no RELATIVE bias, if the age reading errors are normally distributed. The distributions are skewed, if RELATIVE bias occurs.

Seilesing HI 2009, ALDER

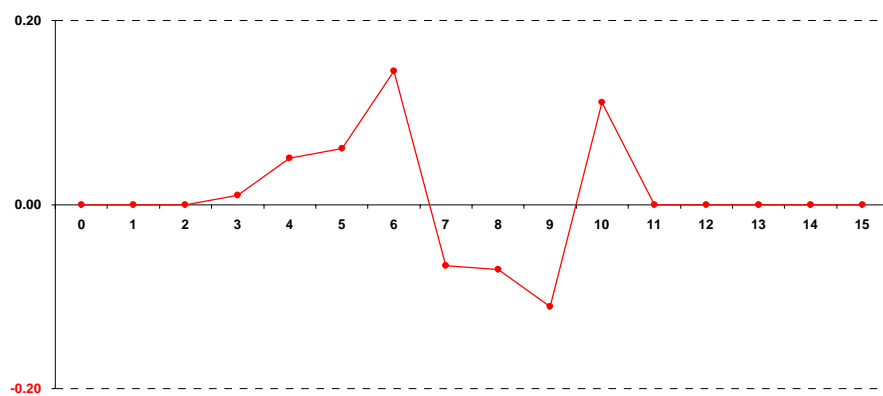


Figure 4 The RELATIVE bias by MODAL age as estimated by all age readers combined.

Seilesing HI 2009, ALDER

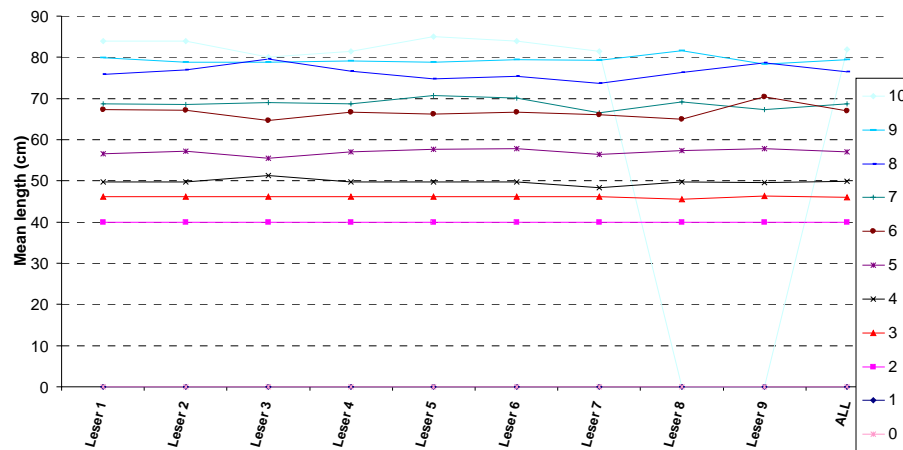


Figure 5 The mean length at age as estimated by each age reader.