

Appendix. Summary of assessment of Steller sea lion populations migrating to Hokkaido waters.

| Population | Okhotsk | Kurile |
|---|--|--------|
| Model applied | Pella-Tomlinson production model ^[1] | |
| Calculation method of catch limit | Potential Biological Removal ^[2] | |
| Conditions of management [§] | Probability of $D_{Limit} = 0.6 K^{**}$: $\geq 60\%$ over 10 yrs. Probability of $D_{Extinct} < 0.05 K^{***}$: $< 10\%$ over 100 yrs. | |
| Estimate of K^{\natural} | 18,000 | 12,000 |
| Lower limit of population estimate (N_{min}) | 10,000 | 8,000 |
| R_{max} | 0.12 | 0.12 |
| F_R | 0.75 | 0.5 |
| Other parameters | | |
| Migration ratio ^{§§} (to Japan Sea) | 0.3 | 0.1 |
| (to Nemuro Strait) | 0 | 0.2 |
| Average bycatch number over past 10 yrs. [‡] | 61 | |

**Probability of population depletion level equal to or exceeding 60% of K [1]

***Probability of population depletion level below 5% of K [1]

§Assessed by the management strategy evaluation (MSE) simulation model[1]

[‡]based on past direct observations at rookeries and catch history[1],[3]–[6]

§§Based on resighting and cumulative survival estimate of branded animals [7] – [10]

‡Average for 2012-2021, based on the survey by Hokkaido Government (unpublished)

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