

DRAFT
Noble Hendrix, QEDA
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Table describing the relative probability of events in which the spawning abundance declines by more than 10% over several time periods.

Table 1. Relative probability of events in which there is a decline in spawner abundance of \geq 10% in time lags of 1, 4, 12, or 20 years under the COS and PA.

	1 Year	4 Years	12 Years	20 Years
Pr COS has more events	0.265	0.235	0.296	0.171
Pr of equal number of events	0.279	0.234	0.26	0.24
Pr PA has more events	0.456	0.531	0.444	0.589

Description

We compared spawner abundances to indicate which alternative (i.e., COS vs. PA) is more likely to experience population declines of 10% or greater in order to evaluate relative risk of extinction (Lindley et al 2007). To calculate this metric, we ran the model for 1000 iterations to represent multiple “states of nature.” In each of the model iterations, we incorporated four different time lags ($X = 1, 4, 12, \text{ or } 20$ years) to calculate whether the abundance X years in the future had declined by 10% or more. For a given iteration, we summed the number of events with population declines of 10% or more for each alternative and assigned the outcome into three possible categories: 1) the number of events where abundance decreased by 10% or greater was higher in the COS than the PA, 2) the number of events were equal, or 3) the number of events were higher under the PA than the COS. The probability of each outcome was computed as the number of outcomes in each of the three categories divided by the total number of iterations, i.e. 1000.

Interpretation

When there is a lag of 1 year, there is a 0.28 probability of equal performance under the two actions; that is, having equal numbers of events in which the population declines by 10% or more in the each action. There is a 0.27 probability of worse performance under the COS relative to the PA; that is, having more events in which the spawner abundance declines by more than 10% under the COS relative to the number of events under the PA. Finally, there is a 0.46 probability of worse performance under the PA; that is, more events where the spawner abundance declines by more than 10% under the PA relative to the number of events under the COS.

It is important to note that this analysis does not indicate that there is a 0.265 probability of a decline by at least 10% under COS and a 0.456 probability of a decline of this magnitude under the PA. Instead, it indicates that over the 75-year timeframe (year 5 to 79), there is a higher probability of events in which next year’s spawner abundance will drop by at least 10% under the PA (0.456) relative to the number of events under the COS (0.265). This general pattern of

higher numbers of events in the PA relative to the number of events in the COS over the 75-year timeframe is consistent for spawner abundances at lags of 4 and 12 years with a shift toward more events under the PA relative to the COS at a lag of 20 years.

This metric reflects the lower mean spawner abundance and higher variability in the spawning abundance (variance in spawner abundance under PA is 6.23% higher, 95%CI: -0.263%, 12.3% relative to variance in COS spawner abundance and probability that variance is higher under PA relative to COS is 0.971). This pattern is illustrated in the relative percent difference plot of spawner abundance over time. The lower mean spawner abundance is indicated by the percent differences being below the horizontal 0 line, whereas the variance is indicated by the year to year variability in the differences among years.