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Scaling of expected survival time in a stochastic harvesting model HAROLD HASTINGS, Hofstra University and Bard College at Simon's Rock, MICHAEL RADIN, TAMAS WIANDT, Rochester Institute of Technology — We explore the dynamics of modified version of a standard fishery model (Gordon-Schafer-Munro [1], with additive and multiplicative noise, under a quota-based harvest. A harvest quota induces an effective strong Allee effect (a positive unstable steady state population level, below which populations die out), with expected survival time following generalized Ornstein-Uhlenbeck dynamics [2]. In particular, for additive noise, the expected survival time is exponential in  $s^3/\sigma^2$ , where s is the difference between stable and unstable steady state populations and  $\sigma$  the noise level. Thus survival time depends sensitively upon harvest quota (which determines steady state population), perhaps a warning to avoid future collapses such as that of the Atlantic cod fishery [3]. 1. Gordon HS. J Fisheries Board Canada 10, 442 (1953); Schaefer MB. ibid 14, 669 (1957); Clark, CW, Munro GR. J Environ Econ and Management 2, 92 (1975). 2. Beale PD. Phys Rev A 40, 3998 (1989). 3. c.f. www.millenniumassessment.org/

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