

Optimal Programs on Invasive Species Management under Growth Uncertainty and Measurement Error*

Koji Kotani[†] Makoto Kakinaka[‡] Hiroyuki Matsuda[§]

March 5, 2007

Abstract

The management programs for invasive species have been proposed in many regions. The resulting outcome on success or failure seems to be significantly affected by the degrees of multiple uncertainties, such as growth uncertainty and measurement error, associated with management practices. This study first examines the optimal policy on invasive species management under growth uncertainty, and then incorporates measurement error into the model. We find various novel results and discuss related policy implications that emanate from the interplays between two sources of the uncertainty. The corresponding values of the optimal programs are also examined.

Key Words: bioeconomic model, invasive species management, growth uncertainty, measurement error, stochastic dynamic programming, value of optimal program

JEL Classification: Q57, Q58

*We are responsible for any remaining errors.

[†]Research Fellow of the Japan Society for the Promotion of Science. Faculty of Environment and Information Sciences, Yokohama National University, 79-7 Tokiwadai, Hodogaya-ku, Yokohama, Kanagawa 240-8501, Japan (e-mail: kkotani@ynu.ac.jp).

[‡]Assistant Professor. International Development Program. Graduate School of International Relations, International University of Japan. 777 Kokusai-cho, Minami-Uonuma, Niigata 949-7277. Japan (e-mail: kakinaka@iuj.ac.jp).

[§]Professor. Faculty of Environment and Information Sciences, Yokohama National University. 79-7 Tokiwadai, Hodogaya-ku, Yokohama. Kanagawa 240-8501. Japan (e-mail: matsuda@ynu.ac.jp).