Author’s Accepted Manuscript

Optimal monitoring and control under state uncertainty: application to lionfish management

David M. Kling, James N. Sanchirico, Paul L. Fackler

PII: S0095-0696(16)30262-5
DOI: http://dx.doi.org/10.1016/j.jeem.2017.01.001
Reference: YJEEM1998

To appear in: Journal of Environmental Economics and Management

Received date: 9 September 2016
Accepted date: 2 January 2017

Cite this article as: David M. Kling, James N. Sanchirico and Paul L. Fackler
http://dx.doi.org/10.1016/j.jeem.2017.01.001

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Optimal monitoring and control under state uncertainty: application to lionfish management

David M. Kling\textsuperscript{a,1,2}, James N. Sanchirico\textsuperscript{b}, Paul L. Fackler\textsuperscript{c}

\textsuperscript{a}Assistant Professor, Department of Applied Economics, Oregon State University, Corvallis, 
\textsuperscript{b}Professor, Department of Environmental Science and Policy, University of California, Davis and University Fellow, Resources for the Future, Washington, DC, 
\textsuperscript{c}Professor, Department of Agricultural and Resource Economics and Associate Professor, Department of Applied Ecology, North Carolina State University,

david.kling@oregonstate.edu  
jsanchirico@ucdavis.edu  
pfackler@ncsu.edu

Abstract

State variables in many renewable resource management problems, such as the abundance of a fish stock, are imperfectly observed over time. In systems characterized by state uncertainty, decision makers often invest in monitoring to learn about the level of a stock. We develop a stochastic bioeconomic model of marine invasive species management under state uncertainty. The decision maker in our model simultaneously evaluates optimal investment in monitoring and population control. Using a recently-devised method for solving continuous-state Partially Observable Markov Decision Processes (POMDPs), we find that the ability to learn through monitoring can alter the role of population control in the optimal policy function, for example by reducing control intensity in favor of monitoring. Optimal monitoring depends on the management context, including in our application lionfish population structure. The rich

\textsuperscript{a} We are grateful to our handling editor and two anonymous referees, whose comments and suggestions helped us improve the quality of this research significantly. For helpful feedback on earlier versions of this research, we thank Jay Abolofia, Yong Chen, Doug Larson, John Lynham, Lars Olsen, Mike Springborn, Jim Wilen, and seminar participants at the 2013 ASSA Meeting, University of California at Davis, University of Connecticut, University of Delaware, University of Maryland, and Oregon State University. Background research for this paper was enhanced by discussions with Lad Akins, Juan Agar, Dominique Lazarre, Catherine MacDonald, Vanessa McDonough, and James Morris Jr. Kling acknowledges generous support from a NOAA Fisheries/ Sea Grant Graduate Fellowship (#NA11OAR4170179). All errors in this paper are the responsibility of the authors.  
\textsuperscript{1} Contact author  
\textsuperscript{2} Tel. (541) 737-1418; fax (541) 737-1411
دریافت فوری
متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات