Assessment of Beached Bird Modeling Methods

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1.0 Introduction

Potential avian impacts are often a key liability component of Natural Resource Damage Assessment (NRD) under the Oil Pollution Act of 1990 (OPA). The foundation of those liability estimates is the estimate of total acute avian mortality. Indeed, many Trustee agencies, including the United States Fish and Wildlife Service (USFWS), and the California Office of Spill Prevention and Response (OSPR), currently translate acute mortality estimates directly into injury and restoration projects using predetermined conversion factors based on "standard" Resource Equivalency Analysis (REA) (See Sperduto et al. 2003 for USFWS methods, and CDFG 2004 for OSPR). As such, liability levels are largely established once total acute mortality is estimated.

The methods used to estimate total acute mortality following an oil spill fall into three broad categories: literature transfer (RIDEM 1998), Beached Bird Modeling (BBM) (Ford 1987), and swept through calculations (French et al. 1996). Among the three, literature transfer requires the least amount of data but also generates the most uncertain results. Beached Bird Modeling is the most data intensive method, but is generally thought to generate the most reliable results. Swept through calculations are intermediate in both data requirements and uncertainty.

This paper has three purposes. The first is to provide NRD practitioners with an overview of methods commonly used to asses acute avian mortality following oil spills. The second purpose is to provide NRD practitioners with an understanding of the BBM, the data required to support BBM modeling, uncertainties associated with BBM results, and steps that can be taken to reduce those uncertainties. Finally, we outline methods designed to help Trustee and responsible party representatives cooperatively identify optimal strategies throughout the BBM process.

The BBM has been selected for in depth analysis for several reasons:

- The BBM has been the assessment tool of choice for most recent west coast spills (Kure, New Carissa, Stuyvesant, Luckenback);
- The BBM was used recently used on a major east coast spill (Bouchard Barge-120 in Buzzards Bay MA);
- USFWS recently conducted training to facilitate wider use of the BBM on the east coast; and
- BBM results can be sensitive subtle variations in assumptions and modeling approach. These sensitivities have not been addressed in the literature.

Our goal is to facilitate an understanding of the input data required by the BBM, the uncertainty associated with the BBM, and how spill response and post-hoc activities can be used to address those uncertainties.

The main body of this reported is divided into an additional six sections:

- Section 2: Alternative methods for estimating acute avian mortality;
- Section 3: BBM mechanics;
- Section 4: Critical response activity and post-hoc studies in support of BBM;
- Section 5: Estimating mortality using the BBM;
- Section 6: BBM sensitivity; and
- Section 7: Summary and BBM recommendations based on expected benefits and costs.

Appendix C is a series of short tables designed to help the NRD responder make BBM related decisions in an emergency response situation.