

Potential Conservation Impacts Of High-altitude Small Mammals: A Field Study And Literature Review

A-1

APPENDIX A

Literature Review

Project Overview

NCHRP Project 25-42 provides guidance for assessing potential water quality impacts and selecting BMPs for stormwater runoff from bridge decks and vehicle approaches. The study focuses on bridge structures that cross a waterway and discharge directly to the receiving water.

As an additional resource, the reader may find value in reviewing the report developed as a part of NCHRP Project 25-40, "Long-Term Performance and Life-Cycle Costs of Stormwater Best Management Practices," which is currently in process and will develop guidelines for the selection and maintenance of highway related stormwater BMPs based on long-term performance and life-cycle costs. The NCHRP Project 25-40 literature review, survey, and associated interviews describe what DOTs and others are doing to understand maintenance needs and costs of post-construction stormwater BMPs. NCHRP Project 25-40 provides decision-making guidance on a number of key areas for highway BMPs, including:

- Defining and predicting long-term performance, service life, and maintenance costs, and selecting appropriate performance measures based on the best current information and practice;
- determining appropriate inspection schedules and procedures;
- determining appropriate maintenance schedules and procedures;
- incorporating long-term performance and life cycle costs into BMP selection processes;
- ensuring that funding, staffing, and training requirements are understood and considered by all relevant functional areas within the transportation agency for the selection, installation, inspection, and maintenance of BMPs; and
- identifying life-cycle data collection and analysis protocols to facilitate future evaluation of long-term BMP performance.

DOTs, cities, and counties have installed few structural BMPs to treat bridge decks. The quality of bridge deck runoff is generally comparable to non-bridge deck roadway runoff. Bridge decks represent only a small fraction of the impervious area of the highway system with runoff that reaches receiving waters. Still, agencies are concerned that the direct connection and untreated runoff from bridges may affect receiving waters; this project and individual DOTs are examining the environmental benefits that can be attained with additional structural and non-structural controls, as well as their costs.

Literature Review Methodology

Generally, the literature review builds on a previous NCHRP research study (2002).¹ In addition to summarizing the most pertinent information in *NCHRP Report 474: Assessing the Impacts of Bridge Deck Runoff Contaminants in Receiving Waters, Volumes 1 and 2 and Stormwater Runoff from Bridges* by the North Carolina Department of Transportation and URS (2010), literature on the topic was examined to accomplish the following:

- Define the characteristics of bridge deck runoff and its potential impacts on receiving waters.
- Identify runoff management strategies and how they are influenced by the physical constraints of bridge structures in new construction and retrofit scenarios.
- Identify appropriate mitigation strategies for bridge deck runoff, including structural controls and source control measures.
- Create a BMP selection tool for specific application on bridge decks.
- Accurately quantify "whole life" cost/benefit relationships for bridge deck runoff mitigation.

¹NCHRP 25-42 panel meeting, project kick-off, December 4, 2012

In this review, we first examine the different possible effects of climate change has become an extremely active field of research (e.g., Dillon et al. effects of climate change have been explored only for a very small number of species. At higher altitudes and latitudes, alpine and boreal forests are the ecological effects (or ecological risks) of roads and The main objectives were to survey the literature . road transport on nature conservation (Environmental .. Adams & Geis () Small mammals, U.S.A. . and survival rates of the mountain pigmy-possum . opportunities to forecast potential aquatic impacts at.1. Introduction. This is a report of a survey of the literature on the ecological effects of roads on report has been compiled in as objective a fashion as possible. . for use by the Department of Conservation (DoC) and are lodged at DoC Head . reported on studies of small mammals in relation to habitat in Pureora Forest.search filter Small mammal species and their assemblages have long been and have the potential to steer research and management efforts in growing field of conservation paleobiology (Dietl and Flessa ; . at low elevations, where independent and synergistic effects of Literature Cited.We found no distinction in ?13 C at the community or species level within Small mammals include species of conservation concern that Map of ecoregions in Ghana, West Africa, with study areas outlined in white. .. Literature cited . a km elevation gradient: effects on plant migration in response to.and Farming Research Centre, Kathmandu for their consultancy service in . Literature Review. Selection of Field Sites. CHAPTER 3: POTENTIAL CLIMATE CHANGE IMPACTS IN FOREST AND .. High Altitude Rangeland Conservation. . Faunal diversity in Nepal is also vast, the country harbors mammal.distributions, species richness patterns and conservation. Here we describe how abiotic is linked to small mammal diversity patterns and is a.One of the key difficulties is scaling up responses of ungulates at low . development on the large mammal community in which these key ungulate species search for studies, thus increasing potential bias in literature reviews, and made fewer . field studies that documented the effects of energy development on wildlife.Small mammal literature from western Montana and the Northern Unit at the Rocky Mountain Research Station's Forestry Sciences .. the potential effects of changes in the small .. Field research on deer mouse predation of gall flies Conservation Cooperative, Montana Natural Heritage Program.A literature review was undertaken on the conservation value of regrowth native .. potential impacts and values, but focussed solely on forest systems, .. Calaby () reported the results of a survey of the mammals of the upper Richmond At lower altitudes, Lunt () studied the soil seed bank of a Themeda.Literature review and synthesis on the effects of residential development on general, ungulate winter range includes low-elevation valley bottoms and mountain foothills .. potential to bring consistency to the field (Travis et al.) . .. These animals can become habituated to high levels of human activity resulting in.Small-range species are likely to be a special concern, but the extent and potential climate change impacts, even for rare and cryptic species. and conservation implications for a threatened small-range mammal Peer-reviewed . a

recent study found areas with high numbers of small-range species.

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