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Special Issue:
Ecology and management of deer in developed landscapes

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Ecology and management of deer in developed landscapes: An introduction

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During the past 30 yr, white-tailed deer (*Odocoileus virginianus*) populations have become an expanding and increasingly challenging management concern in urban, suburban, and exurban landscapes. Deer populations proliferated in these developed landscapes because high nutrition levels provided by lawns, gardens, and shrubs led to increased reproduction, and the lack of both predators and hunter harvest resulted in reduced mortality. As these deer populations continue to increase, so too are the human–wildlife conflicts such as deer–vehicle collisions, ornamental plant damage, and concerns about zoonotic disease transmission. Deer are not only responsible for millions of dollars in damage to human interests but also act as keystone herbivores shaping vegetation composition in parks and natural areas associated with developed landscapes.

The importance of deer to humans as a valued aesthetic and recreational resource to some humans, or as a

nuisance species to others, cannot be overstated. The restoration of deer populations is one of the great success stories in North American wildlife conservation of the 20th century and deer overabundance in many areas represents one of the greatest wildlife management dilemmas facing biologists and laypersons in the 21st century. Overabundant deer in developed landscapes are particularly important because the science-based, creative approaches to management of these deer will be tested under especially close scrutiny of a public that harbors diverse opinions about deer. If this broad public perceives modern deer management to be effective in dealing with the complexities of the issue, then wildlife conservation will benefit. Those who have worked on these issues know we are facing a tall challenge.

Given the importance of deer in developed landscapes, it is not surprising that there are now several compendia associated with the issue of deer overabundance. The compendia organized and edited by McAninch (**1995**), McShea et al. (**1997**), and Warren (**1997**) portray the evolution of our experience with the issues through the 1980s and early 1990s. However, there have been none since then and our understanding of deer and deer management, especially in suburban and exurban environments, has grown enormously. Our purpose for this special issue of the Wildlife Society Bulletin is to update that evolution by presenting new research on deer ecology and management in developed landscapes. Given that the 1997 issue of the Wildlife Society Bulletin edited by Warren was among the most popular issues of that journal, it is fitting that the Bulletin selected this topic for a special edition in its inaugural year of electronic publication.

This special issue provides a combination of practical information that will be of interest to wildlife managers and the general public, while making available quantitative information about deer–human conflicts and deer ecology relative to human development. We placed special emphasis on capturing the experience with deer management in these landscapes in amassing nearly 30 papers. Although some papers contain findings often not published in professional journals because of the challenges in collecting data and conducting the analyses, all papers are peer-reviewed works. Several of these papers were presented at a symposium of the same name as this special issue at the 15th Annual Meeting of The Wildlife Society in Miami, Florida, during November 2008. Most papers represent previously unpublished information, whereas a few are larger compilations of smaller, separate publications.

We divide this issue into 4 major topics pertaining to deer in developed landscapes: management, ecology, transportation issues, and human dimensions. Management papers include 2 case studies of successful long-term approaches to urban deer management (Hygnstrom et al. **2011** ***a*** , Wiggers **2011**). Companion papers discuss the use and health implications of GnRH immunocontraceptives for managing isolated deer populations in New Jersey (Gionfriddo et al. **2011** ***a*** , ***b***). Management-oriented papers involving agency perspectives (Rudolph et al. **2011**) and a synthesis of several research projects in Michigan (Campa et al. **2011**) provide broad-ranging insight regarding deer ecology and human dimensions in northern regions of deer range. McShea et al. (**2011**) tests assumptions of distance sampling for estimating population abundance of deer. Novel approaches to deer management including regulated commercial harvest (VerCauteren et al. **2011**), harvest donation programs (Hildreth et al. **2011**), and pre-emptive community design to reduce deer–human conflicts (Gorham and Porter **2011**), are also found in this section.

Ecology papers focus on deer demographics (McDonald et al. **2011**), movements and space use (Hygnstrom et al. **2011** ***b*** , Kilpatrick et al. **2011**), and habitat issues (Anderson et al. **2011**, Duguay and Farfaras **2011**). Two manuscripts go beyond white-tailed deer to discuss consequences of winter feeding of mule deer (*O. hemionus* ; Peterson and Messmer **2011**) and impacts of human activity on behavior of elk (*Cervus elaphus* ; Webb et al. **2011**), respectively.

Of particular note are 5 papers that focus on deer and transportation issues. These issues have been the subject of considerable research during the past decade and studies of deer use of underpasses (Dodd and Gagnon **2011**), the effect of roadside fences (Gulsby et al. **2011**), and the impacts of warning signs (Found and Boyce **2011**) provide much-needed insight into the utility of these methods for reducing deer–vehicle collisions. Parker et al. (**2011**) reports on the success of multiple methods for reducing vehicle collisions for the endangered Florida Key deer (*O. v. clavium*). Novel research by Biondi et al. (**2011**) summarizes deer accidents with civil aircraft.

Four papers focus on human dimensions of deer and deer management in developed landscapes. Urbanek et al. (**2011**) surveyed deer biologists from state wildlife-conservation agencies and Stewart (**2011**) assessed attitudes of Indiana residents. Hunter acceptance of alternative deer harvest recommendations (Cornicelli et al. **2011**) and sustainability of archery harvest programs for urban deer (Weckel et al. **2011**) round out the issue.

In summary, we echo the sentiments of Special Editor Robert Warren in the 1997 special issue of deer overabundance and hope that the current issue stimulates greater discussion and research regarding deer in developed landscapes. That 1997 issue of the Wildlife Society Bulletin was indeed successful at furthering our understanding of deer ecology and management and stimulating new research. We can only aspire to the same for this body of work. We also hope you enjoy reading these papers as much as we enjoyed putting them together.

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