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FOR182

Forest Management in the Interface: Wildlife[1]

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Wildlife

Wildlife provides aesthetic, economic, social, spiritual, ecological, and educational benefits to interface residents and visitors. Approximately 87 million people participate in wildlife-associated activities each year, and from those 87 million people, roughly $108 billion is spent to support their activities (U.S. Fish & Wildlife Service and U.S. Department of Commerce 2002).

Figure 1. While a typical wildland-urban interface backyard may provide diverse habitat and species, that habitat and species diversity is distinctly different from the original forest.
Credits: Photo courtesy of Virginia Tech.

Purchases of equipment (e.g., binoculars for bird viewing, fishing gear for fishing, safety clothing for hunting, etc.) and land for wildlife-associated activities represent 1.1 percent of the Gross Domestic Product (Faulkner et al. 1998; U.S. Fish & Wildlife Service and U.S. Department of Commerce 2002; Duryea and Hermansen 2002). In 2001, 66.1 million people participated in some type of wildlife-watching activity such as observing, photographing, or feeding. Of those, 75 percent live in metropolitan areas (U.S. Fish & Wildlife Service and U.S. Department of Commerce 2002). Bird watching, compared to other wildlife-watching activities, attracted the most participants in 2001 (46 million people). Roughly 88 percent of them observed wild birds within a mile of their homes (U.S. Fish & Wildlife Service and U.S. Department of Commerce 2002).

Managing wildlife in interface forests presents unique challenges for landowners and natural resource professionals. The effects from urbanization of contiguous rural forests, especially fragmentation and development, significantly change wildlife habitat. Fragmentation degrades, and in some cases, destroys critical wildlife habitat (Duryea and Hermansen 2002; Cordell and Macie 2002). Wildlife management in the interface is also complex because wildlife can be both an important amenity and a nuisance to human communities. Striking a balance between the needs and wants of interface landowners and what is required to sustain wildlife populations becomes critical. People have conflicts with wildlife, but they also might have conflicting wildlife management objectives (Duryea and

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Hermansen 2002). This section highlights key issues and provides background information on potential conflicts.

A recent report on the Southern Forest Resource Assessment addressed the question, "What are the likely effects of expanding human populations, urbanization, and infrastructure on wildlife and their habitats?" (Wear and Greis 2002). Following are some key results:

- Non-native plants and animals have had a documented influence on forest wildlife and wildlife habitat. Non-native species threaten the survival of some sensitive wildlife species.
- Approximately 42 percent of species that are listed as threatened or endangered under the Endangered Species Act are at risk because of competition with or predation by non-native species.
- Urban and agricultural land uses have interrupted the continuity of southern forests and created forest islands. Wildlife species differ in their response to the resulting fragmentation.
- Urbanization excludes some sensitive forest wildlife species but increases the presence of other more tolerant species. Urban habitats vary in their ability to support a diversity of forest wildlife.
- For species with area sensitivities—those that require forest interior, those that require specialized habitats, and those intolerant of human disturbance—special management considerations will be needed as urbanization increases in areas of the South.
- Roadsides and power-line corridors facilitate the spread of non-native invasive plants and animals. Many non-natives have been slower to gain a foothold in predominately intact forested landscapes.

Human-Wildlife Conflicts

Several species of wildlife, such as white-tailed deer, thrive in fragmented habitats where winter food is often more abundant than in surrounding forests. In many interface areas, wildlife populations have grown so rapidly that managers must control them. Wildlife can be vectors for diseases such as Lyme disease (by way of white-tailed deer and deer mice) and West Nile virus (by way of birds). They can also lead to car accidents, property damage, and other human-wildlife conflicts. Groundhogs and armadillos burrow in people's yards, white-tailed deer and rabbits consume ornamental shrubbery, woodpeckers damage trees, and raccoons and opossums scavenge for human trash and pet food. Population control strategies for species like white-tailed deer include permitting hunting in neighborhood areas, extending hunting seasons, and implementing capture programs and contraception programs. Such management programs can generate controversy and concern from the public and further complicate management decisions.

Species Diversity

Figure 2 shows species frequency distribution by state. At any one location only a small fraction of these species will be seen. For many rare and endangered species, habitat loss is the single greatest threat to survival (Duryea and Hermansen 2002). Unfortunately, urbanization decreases the contiguous forest area on which many of these species depend, while increasing forest edges upon which other species depend, creating difficult and conflicting management challenges. For example, studies have found that urbanization decreases the number of bird species while increasing the total number of individual birds, thus favoring dominance by a few species. Forest insectivores, neotropical migrants, and forest interior specialist populations tend to decline with urbanization (Dowd1992; Graham 2002). For mammals, interface forests also tend to support more habitat generalists rather than specialists, as well as high populations of non-native species.

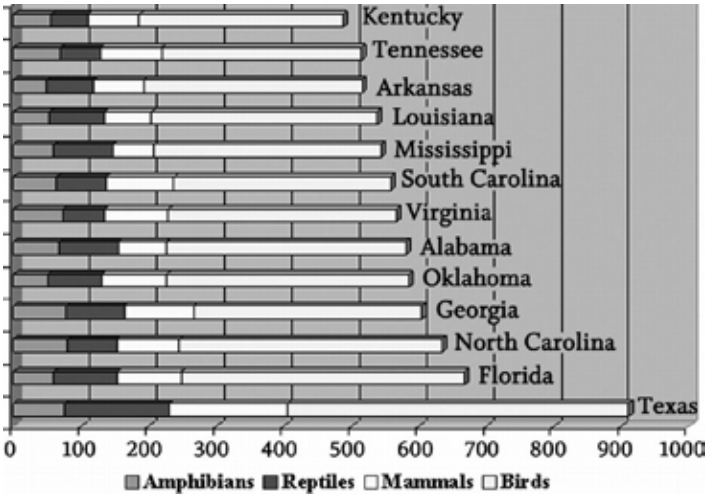

Figure 2. Total number of species, by taxonomic grouping, by state within the South.
Credits: Source: Nature serve 2000.

Managing Nuisance Wildlife

Human-wildlife conflicts often arise in interface forests due to several factors: (1) the availability of a relatively predator-free environment, (2) an abundant and diverse food

resource (including that directly provided by humans), and (3) available cover and space. The highly altered habitats characteristic of the interface provide an abundance of niches that often are occupied by species that display the greatest resilience and adaptability to existence in human-modified systems (Conover 2002).

Successful management of interface wildlife must start with the realization that regardless of what is driving habitat change, the modifications will prove beneficial for some species and detrimental to others. Although management activities may aim to promote or enhance a particular species or group of species, they likely will benefit other species as well, many of which become labeled as "nuisances" or "problem species." Careful planning can help mitigate conflicts. Because wildlife may roam across large areas comprised of many individually owned parcels, management efforts are most successful when implemented on a community or regional level (Decker, Brown, and Siemer 2001).

Techniques for managing nuisance wildlife are many and varied (Cummings 1999).

Exclusion

Damage by birds or rabbits to ornamental shrubs or garden plants can be reduced fairly inexpensively by simply placing netting over the plant(s) to keep the pests away. On the other hand, fencing out deer from a lawn or garden can be costly. Materials needed for exclusion will depend upon the species causing the problem. Large mammals can be excluded with woven wire fences, electric fences, and plastic fences.

Habitat Modification

Habitat modification can provide lasting and cost-effective relief from damage by limiting access to one or more of the requirements for life — food, water, or shelter. Rodent- or bat-proofing buildings by sealing cracks and holes prevents these animals from gaining access to suitable habitats. Storing seed and pet food in tightly closed containers, controlling weeds and garden debris around homes and buildings, and storing firewood and building supplies on racks or pallets above ground level can limit or remove the animals' sources of food, water, or shelter. However, habitat modification, while limiting nuisance wildlife, may also limit desirable species such as songbirds as well.

Repellents

Objectionable-tasting coatings or odor repellents may deter wildlife from feeding on plants. Other repellents such as sticky, tacky substances placed on or near windows, trees, or buildings may deter many birds and small mammals. Unfortunately, most wildlife soon discover that repellents are not actually harmful and may soon become accustomed to the smell, taste, or feel of these deterrents. In order to be effective, repellents applied outdoors must to be reapplied due to rain or heavy dew or applied often to new plant growth.

Toxic Baits and Pesticides

Toxic baits and pesticides can harm pets, humans, and animals other than the targeted pest. Experience and training are required to protect safety and get the desired effect. Please consult a licensed expert.

Glue Boards and Traps

Glue boards trap small mammals and snakes. Applying vegetable oil to the caught animal will dissolve the glue, allowing for release of the animal. Using traps can be very effective in reducing actual population numbers of certain species. However, trapping is often not a viable solution for landowners because it is illegal to trap many species without a permit nor is it legal to release trapped animals on public or private land without permission.

Scare Tactics

Bells, whistles, horns, clappers, sonic emitters, audio tapes, and other sound devices may be quite successful in the short term in repelling an animal from an area. Other objects such as effigies, lights, reflectors, and windmills rely on visual stimulation to scare a problem animal away. Often nuisance animals become accustomed to these tactics and will return if exposed to these devices daily.

The Wildlife Management Damage network provides pointers, training, and listserv discussions for dealing with nuisance wildlife problems. The Humane Society of the United States provides specific recommendations for dealing with everything from bears and beavers to snakes and squirrels.

Attracting Wildlife

Many interface landowners want to attract moderate numbers of certain types of wildlife. There are some general guidelines for attracting wildlife: (1) Minimize habitat reduction by concentrating buildings and roads on one part of the property; (2) Develop or enhance a wide range of habitats, from early successional forest to late successional forest; and (3) Provide opportunities for food, water, and cover. Most mast- and fruit-bearing shrubs and trees attract

wildlife. Trees in the white oak family are preferred over trees in the red oak family because they produce acorns every year rather than every other year and contain lower tannins and phenols. *Table 1* reviews the top ten tips for successfully attracting wildlife (Hostetler et al. 2003).

Many species have unique habitat needs, others can prosper in many conditions. The common crow and mourning dove, for example, prosper along edges, whereas some neotropical migratory birds require interior forests. Table 2 reviews the habitat needs of many popular bird species. Those that are tolerant to interface conditions are more likely to prosper in edge forests and diverse conditions characteristic of fragmented interface landscapes. Those species that are intolerant either depend upon food sources that are unavailable in interface forests or are susceptible to predators common in interface forests.

Suggested Readings

Solving Problems with Your Wild Neighbors (http://www.hsus.org/wildlife/urban_wildlife_our_wild_neighbors/solving_problems_with_your_wild_neighbors/) by the Humane Society of the United States, 2005.

Homes for Birds (http://baltimorebirdclub.org/by/feed.html#0) by the U.S. Fish and Wildlife Service, 1988.

Keeping Wildlife at a Safe Distance (http://cc.usu.edu/~rschmidt/wdamage.htm) by R. H. Schmidt and R. Beach, 1997. Wildlife Management Damage Network, Logan UT: Utah State University, Department of Fisheries and Wildlife.

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Table 1. Landscaping Backyards: Top Ten Tips for Sucess

1. Limit amount of lawn -- Grass alone does not provide adequate cover, food, and water for wildlife.
2. Increase vertical layering -- Layering provides cover and diversifies habitat, though it can increase fire risk.
3. Leave snags and brush piles -- Snags and brush piles provide attractive cover and nest sites away from structures to reduce fire risk.
4. Provide water source -- Bird baths or small backyard ponds are a good source of water.
5. Plant native vegetation -- Native vegetation, preferably mast-bearing, attracts native wildlife.
6. Put up bird feeders and bird/bat houses -- Multiple styles and sizes can encourage a variety of species.
7. Remove invasive exotics -- Invasive exotics can potentially alter an ecosystem, making it undesirable for native wildlife.
8. Manage household pets -- Cats and dogs harass and kill wildlife. It is best to keep cats indoors and dogs fenced in or tied up.
9. Reduce pesticide use -- Pesticide affects the food supply (grubs, insects, etc.) and exposes animals to hazardous contaminants.
10. Expand scale of habitat -- Often a particular species needs habitat larger than what a single yard can offer. If landowners manage their yards similarly, wildlife may be more inclined to find the combined habitat desirable.
Source: Hostetler et al. *2003.*

Table 2. Some Southeastern Forest Bird Species and Their Sensitivities to Interface Development *Source: Canterbury* et al. *2000.*

Assemblage	Common name	Scientific name	Interface
Mature-forest assemblage(late-successional forests)	Pine warbler	Dendroica pinus	Tolerant
	Red-eyed vireo	Vireo olivaceus	Intolerant
	Red-bellied woodpecker	Melanerpes carolinus	Tolerant
	Wood thrush	Hylocichla mustelina	Intolerant
	Ovenbird	Seiurus aurocapollus	Intolerant
	Hooded warbler	Wilsonia citrina	Intolerant
	Acadian flycather	Empidonax virescens	Intolerant
	Scarlet tanager	Piranga olivacea	Intolerant
	Northern parula	Parula americana	Intolerant
	Black-and white warbler	Mniotilta varia	Intolerant
	Hairy woodpecker	Picoides villosus	Tolerant
	Pileated woodpecker	Dryocopus pileatus	Intolerant
	Yellow-throated warbler	Dendroica dominica	Intolerant
	Prothonotary warbler	Protonotaria citera	Intolerant
	Kentucky warbler	Oporornis formosus	Intolerant
	Louisiana waterthrush	Seiutus motacilla	Intolerant
Shrubland (early-successional clearcuts)	Indigo bunting	Passerina cyanea	Intolerant
	Yellow-breasted chat	Icteria virens	Intolerant
	Common yellow-throat	Geothlypis trichas	Intolerant
	white-eyed vireo	Vireo griseus	Intolerant
	Prairie warbler	Dendroica discolor	Intolerant
	Field sparrow	Spizella pusilla	Intolerant
	Gray catbird	Dumetella carolinensis	Tolerant

Assemblage	Common name	Scientific name	Interface
Forest-edge (fragmented landscapes)	Brown-headed cowbird	Molothru ater	Tolerant
	Northern mockingbird	Mimus polyglottos	Tolerant
	Chipping sparrow	Spizella passenrine	Tolerant
	American robin	Turdus migratorius	Tolerant
	Eastern bluebird	Sialia sialis	Tolerant
	Common grackle	Quisalus quiscula	Tolerant
	Eastern kingbird	Tyrannus tyrannus	Rual/agricultural
	Red-headed woodpecker	Melanerpes ererythrocephalus	Somewhat tolerant
	Orchard oriole	Icterus spurious	Rural/agricultural
	House finch	carpodacus mexicanus	Tolerant
Habitat generalist	Cardinal	Cardinalis cardinalis	Tolerant
	Carolina wren	Thryothorus ludovicianus	Tolerant
	Tufted titmouse	baeolophus bicolor	Tolerant
	Blue-gray gnatcatcher	Polioptila caerulea	Intolerant
	Carolina chickadee	Poecile carolinensis	Tolerant
	Blue jay	Cyanocitta cristata	Tolerant
	Great crested flycatcher	Myiarchus crinitus	Somewhat tolerant
	Summer tanager	Piranga rubra	Intolerant
	Downy woodpecoer	Picoides pubescens	Tolerant
	Yellow-billed cuckoo	Cooccyzus americanus	Intolerant
	Eastern wood pewee	Contopus virens	Intolerant
	Mourning dove	Zenalda macroura	Tolerant
	Common crow	Corvus brachyrhynchos	Tolerant
	Northen bobwhite	Colinus virginianus	Intolerant
	Brown thrasher	Toxostoma rufum	Intolerant
	Northern flicker	Colaptes auratus	Tolerant
	American goldfinch	Carduelisl tristis	Tolerant
	Red-shoulderd hawk	Buteo lineatus	Tolerant
	Yellow-thorated vireo	Vireo flavifrons	Intolerant
	Ruby-throated hummingbird	Archilochus colubris	Tolerant
	Eastern Phoebe	Sayornis phoebe	Tolerant
	Eastern screech-owl	Otus asio	Tolerant
	Common nighthawk	Chordeiles minor	Tolerant
	White-breasted nuthatch	Sitta carolinesis	Tolerant