FROM THE PRESIDENT

William A. Demmer
PRESIDENT
Boone and Crockett Club

The Changing Landscapes of Wildlife Conservation: Fragmentation and Human Values

***Fair Chase* magazine's president's column provides a wonderful opportunity for me to highlight for our Members and Associates critical issues that we North American hunter-conservationists face. Throughout the balance of my term you will be able to read about the science and the rationale that define these critical issues. The defining articles will be written by Professional Members of the Club who can speak to the science and policy dimensions of each issue. My immediate predecessor, Past-President Ben Wallace, wrote in one of his columns about the powerful value that our Professional Members bring to the Boone and Crockett Club. I promise that as you read their input you will experience a level of confidence that our Club indeed has assembled North America's top conservation "thought leaders" to help us deal with these vexing conservation challenges.**

The first critical issue that I have selected to present is that of land/habitat fragmentation. The summer of 1994 provided me with my first insights into the danger that our wildlife populations face with the challenges of land/habitat fragmentation. I was attending our Boone and Crockett Club summer Conservation Division retreat at the Club's Theodore Roosevelt Memorial Ranch in Dupuyer, Montana.

The Club's Conservation Division historically includes many of our Professional Members who represent the cream of thought leadership in the North American conservation movement. I was participating in a brainstorming exercise with a group of our professionals, in an effort to list and prioritize the greatest challenges to North American wildlife. Jack Ward Thomas, former chief of the U.S. Forest Service, Boone and Crockett Professional Member, and at the time, our Boone and Crockett Endowed Chair at the University of Montana, stated emphatically that land and habitat fragmentation was the greatest threat to thriving wildlife populations that we face in North America.

In this issue, Winifred "Wini" Kessler, Ph.D., Professional member and former Alaska Regional Director, U.S. Forest Service, discusses the science of changing landscapes of wildlife conservation, and in particular, the relationship between fragmentation and human values.

John Organ, Ph.D., Chief, Division of Wildlife and Sport Fish Restoration, U.S.F.W.S. and Professional member presents the policy perspectives associated with fragmentation. It is my hope that with a better understanding of these critical issues and armed with potential solutions that our Club membership, associates and other readers will become activists and engage in the solutions to help mitigate these challenges.

Land fragmentation, simply put, is the division of wildlife habitat into smaller subsets, making it less suitable for wildlife. These subsets, when use is refocused, whether from farm or ranchland to residential, or from multiple crop application to a single crop cooperative farming in large blocks, can devastate wildlife. This fragmentation is occurring on the West Coast, in the Northwest and the Rocky Mountains. The East Coast, Midwest and southern parts of the U.S. have seen major wildlife habitat environment disappear to land developers. My home state of Michigan has seen what was once great pheasant habitat disappear primarily due to the changes in how agriculture is farmed. As large-scale farming took hold, small 100-acre farms with their hedgerows disappeared along with our wild pheasant populations.

Land fragmentation is the division of wildlife habitat into smaller subsets, making it less suitable for wildlife.

What can we as hunter-conservationists do to impede this loss of habitat? The American Wildlife Conservation Partners, an organization that the Boone and Crockett Club helped create, has some powerful recommendations.

A great place to start is to engage with and or inspire landowners to engage in programs where government incentives make it worthwhile to participate in habitat enhancement. Such opportunities include the Wildlife Habitat Incentive Program, Grassland Reserve Program, Conservation Security Program, Environmental Quality Incentives Program, Forest Land Enhancement Program, and of course, the venerable Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP). The CRP and the WRP have proven to be powerful programs that have substantially benefitted wildlife. These programs provide income support and incentives to landowners while the benefits to the public include enhanced wildlife habitat, reduced soil erosion, improved water and air quality, and additional public space.

Supporting the idea of, or creating conservation easements with your land is another wonderful way in which to inhibit land fragmentation. Putting my money where my mouth is, a close hunting friend (and fellow Boone and Crockett Member), Jake Shinners, and I have created conservation easements on our hunting and fishing property in northern Michigan. We also have hunting property in southern Michigan where we have participated with both federal and state habitat incentive programs for years. These public-private partnerships that we have formed have greatly benefitted both us and our neighbors. My wife and I have hunting property in South Carolina's ACE Basin with a significant part of it in a conservation easement. The ACE Basin is a magnificent example of a public-private partnership. The ACE Basin is perhaps the largest protected wildlife and hunting estuary on the East Coast.

Your Boone and Crockett Club is most active on the national conservation policy front in supporting all of the opportunities mentioned. Local action is also required from our community of hunter-conservationists! Let your state and federal politicians know of your feelings regarding these issues.

Your state wildlife conservation agencies need your support whether it is in political arm twisting or testifying in regional habitat and hunting hearings. Please think about what you can do for your community. Do know that your Boone and Crockett Club is engaged on your behalf!

To Wini and John, a public thank you not only for these terrific articles, but for your passion in all that you do for our community. ■

Wm A. Demmer

The Science Perspective

By Winifred B. Kessler, PhD
B&C Professional Member

"Fragmentation" became a common term in wildlife ecology around 1984 when the late Larry D. Harris published his landmark book, *The Fragmented Forest*. Working in northwest coastal forests when the spotted owl issue was heating up, Dr. Harris took a big-picture look at what happens when habitats—in this case, old-growth forests—are logged, roaded, built on, and otherwise converted from large expanses into smaller, discontinuous units. You might think that if development removes just 10 percent of a forest, then the wildlife living there still have 90 percent of good habitat left. Not a big deal, right? Actually it can be a very big deal, depending on the pattern of habitat alteration and the species involved. Dr. Harris' book (and countless studies since that time) has shown habitat fragmentation to be a complex phenomenon involving myriad causes and effects.

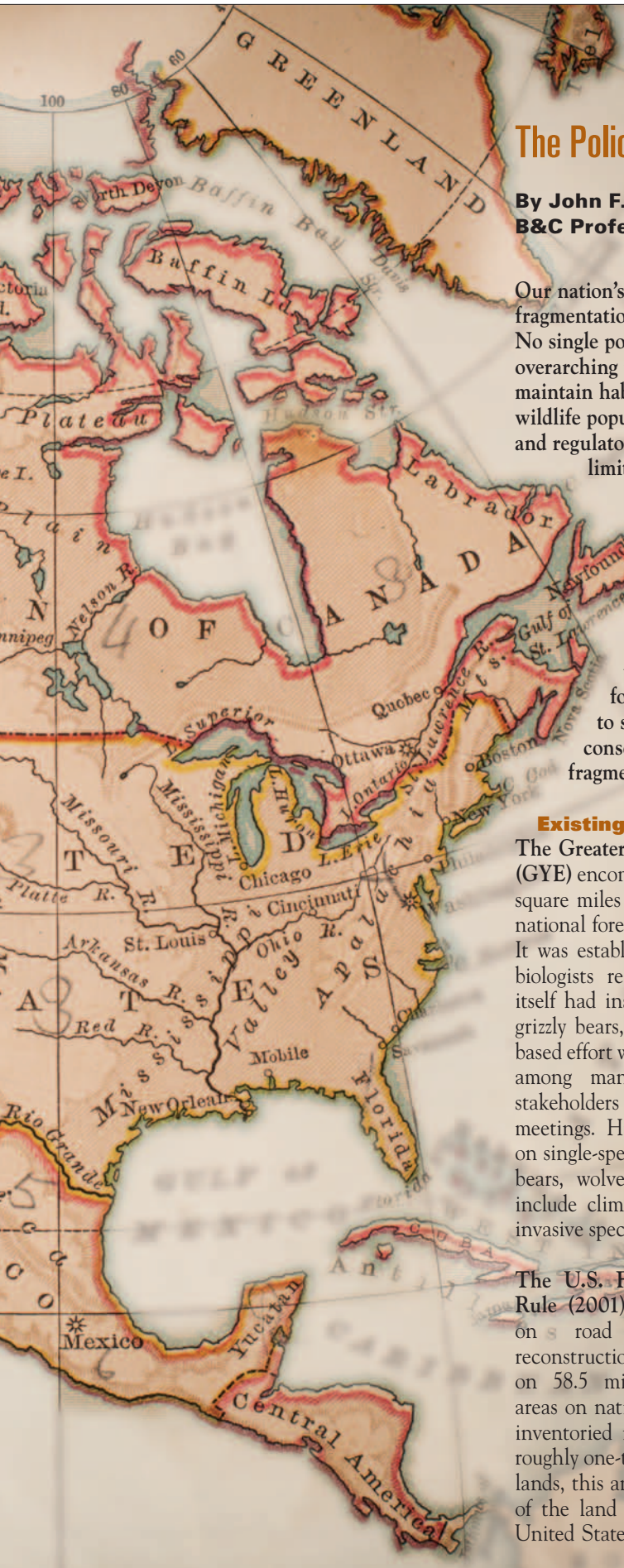
That's because fragmentation involves not only a net loss in habitat; it also affects ecological relationships and the suitability of habitat to support wildlife species. The causes of habitat fragmentation vary greatly: conversion to farmland, residential sprawl, roads and highways, hydro-electric corridors, oil and gas pipelines, mining, seismic corridors for energy exploration, new shopping malls, and on and on. The overall effect is to break up large areas of habitat into smaller units, often called "patches." This gives rise to secondary effects that affect wildlife in various ways.

Patch-size effects happen when the remaining units of habitat are inadequate to support individual species or the overall diversity of organisms that had existed before. For some species, such as the American marten or the grizzly bear, the patches may be too small to provide territories. Many birds may be unable to find the abundance and variety of insects needed for food. Why? Because environmental conditions change when habitat blocks are broken up into smaller pieces: more sunlight can get in around the edges—and more wind too—which dries up the soil surface more quickly so insect larvae die, and so on. Small patches are fundamentally different than large patches, and this affects the capability of habitat to support wildlife.

Edge effects refer to changes that originate along the edges where two habitat types meet. New edge is created whenever a piece of habitat is removed or altered, and linear developments such as roads, energy corridors, and pipeline rights-of-way create long spans of edge that can literally crisscross the landscape. Hunters know that edge effect can be a positive habitat feature for deer, elk, pheasants, and other species they value highly. However, edge effects can be negative when they allow harmful organisms, such as invasive plants and parasites, to enter previously-intact areas of habitat. Edge effects have great potential to change species relationships, often with undesirable consequences. So many studies have documented edge-related declines in forest bird species that a new term, "forest interior-dependent species," was added to the ecologist's lexicon. Edges allow predators such as crows, and nest parasites such as brown-headed cowbirds, to enter forest habitats and render them uninhabitable to many songbird species. Scientists have found that in old-growth reserves in Pacific Northwest forests, barred owls gaining entry along adjacent edges are displacing management's target species, the spotted owl. Similarly, woodland caribou are a big conservation concern where I live in northern British Columbia. The large tracts of intact forest that caribou inhabit are changing, as roads, seismic lines, and energy corridors are built to support natural resources development. One effect of all this edge is increased growth of shrubs and young trees, and this causes moose, deer, and elk to move into forests they formerly avoided. Wolves, bears, and other predators are not far behind and for caribou, this means greatly increased risk of predation.

Isolation effects happen when wildlife are cut off from habitats or from others of their species, including potential mates, by habitat fragmentation. Consider the plight of many frog and salamander species that breed in low-lying wetland patches and then disperse into upland habitats until the next breeding season. A new roadway may not seem like a big change but if it cuts these animals off from their breeding ponds, the population's future is bleak. In the case of the endangered Florida panther, low population numbers and isolation due to habitat fragmentation have resulted in inbreeding, and this in turn has caused chronic infertility and heart problems. Plus, Florida panthers often get hit by cars—another consequence of habitat fragmentation.

Habitat fragmentation is a huge conservation issue because it is happening all over North America at escalating rates. Habitat is shrinking overall and is being changed by the many forms of habitat fragmentation. With a growing human population and rising need for resources, we can't turn back the clock to halt development. Rather, we need to be smarter in how that development proceeds, taking into account habitat fragmentation and the cumulative effects of development. We must plan for desired landscape conditions rather than settling for the default situation of uncoordinated and uncontrolled fragmentation. The key is in science-based, forward-looking policies that place a high value on intact ecosystems and a future shared with wildlife. ■



The Policy Perspective

By John F. Organ, PhD
B&C Professional Member

Our nation's policy on habitat fragmentation is, well, fragmented. No single policy provides overarching national direction to maintain habitat integrity and viable wildlife populations. Rather, policy and regulatory tools exist that might limit fragmentation of habitats if collectively applied within an overarching vision. I will provide some examples of such policy instruments, then address the need for an overarching vision to slow the pace and consequences of habitat fragmentation.

Existing Mechanisms

The Greater Yellowstone Ecosystem (GYE) encompasses more than 18,000 square miles including national park, national forest, BLM, and state lands. It was established decades ago when biologists realized Yellowstone Park itself had insufficient area to sustain grizzly bears, and a larger ecosystem-based effort was needed. Coordination among management agencies and stakeholders occurs through biennial meetings. Historical focus has been on single-species management (grizzly bears, wolves), but looming threats include climate change impacts and invasive species.

The U.S. Forest Service Roadless Rule (2001) establishes prohibitions on road construction, road reconstruction, and timber harvesting on 58.5 million acres of roadless areas on national forest lands. While inventoried roadless areas constitute roughly one-third of all national forest lands, this amounts to only 2 percent of the land base in the continental United States. Controversial since its passage in 2001, the Roadless Rule has been subject to extensive litigation by those desiring increased access to resources.

Vermont's Land Use and Development Act (Act 250) was passed by the Vermont legislature in 1970 in response to public concerns over development pressures resulting from the opening of interstate highways I-89 and I-91. Intended in part to assure development will not imperil wildlife habitat or endangered species, Act 250 has been used by the Vermont Department of Fish and Wildlife to effectively protect wintering habitat for white-tailed deer.

Maine's Beginning With Habitat Program (BwH) is a collaborative approach to conserving wildlife and plant habitat on a landscape scale. BwH compiles habitat information from multiple sources and makes it accessible to towns, land trusts, conservation organizations and others to encourage proactive and informed land-use planning. Each Maine town is provided with maps and other resources to disclose which habitats of statewide and national significance occur locally. Also provided are tools to help community decision makers create a landscape vision and plans that provide habitat for all species by balancing future development with conservation.

Massachusetts BioMap is a geographic information system developed by the Massachusetts Department of Fish and Game and available to the public. It is designed to guide strategic biodiversity conservation in Massachusetts by focusing land protection and stewardship on areas that are most critical for ensuring the long-term persistence of rare and other native species, habitats, exemplary natural communities, and a diversity of ecosystems. BioMap is also designed to include the habitats and species of conservation concern identified in the State Wildlife Action Plan (SWAP).

These are just a few examples of policy instruments that exist for addressing habitat fragmentation. While a broad national vision has been lacking, there is some recent progress. Since 2006, the Wildlife Habitat Policy Research Program has been improving information and tools to accelerate the conservation of wildlife habitat in the United States with a view to a national wildlife habitat system. According to the program's estimates, conserving an additional 218 million acres (12 percent of continental U.S.) would protect all priority terrestrial habitat areas identified in SWAPs. The recent Landscape Conservation Cooperatives (LCCs) initiative brings partners together to design visions for important landscapes in the U.S. These LCCs provide a forum for states, tribes, federal agencies, non-governmental organizations, universities and other groups to collaborate in defining shared conservation goals. A critical role of LCCs is to provide the science and technical expertise needed to support conservation planning at landscape-scales.

Future Policy Needs

Aldo Leopold, the architect of the Land Ethic, wrote, "We shall achieve conservation when and only when destructive use of land becomes unethical—punishable by social ostracism." Is it possible to achieve Leopoldian conservation in our society? Economic growth drives the political agenda, not land conservation, and the two are often in conflict. What is needed are national, state, and local policies that incorporate landscape conservation visions, such as those designed by LCCs, into development planning that creates both disincentives for fragmenting wild habitat, and incentives for using existing developed lands.

National Policy

Habitat fragmentation, not just direct impacts to wildlife populations, should be incorporated into review of federal projects under the Fish and Wildlife Coordination Act of 1934.

A presidential executive order directing all federal projects to avoid habitat fragmentation and utilize the best science available from sources such as SWAPs and LCCs.

State Policy

States should develop legislation or policy, similar to those existing for wetlands, that protects large unfragmented blocks of habitat, relying on SWAPs and other science tools. Planning and science resources should be provided by the state to local communities.

Local Policy

Communities should develop plans and ordinances that allow for cluster development (as opposed to minimum acreage and frontage requirements) so development can be concentrated and large undeveloped blocks maintained.

I would be remiss to not mention a bold and uniquely American policy innovation, the Wilderness Act, as a major force for maintaining habitat integrity across vast landscapes. B&C President Emeritus Lowell Baier is writing a scholarly book on that act that will provide much-needed policy guidance for the future of wilderness management and contribute to the great American experiment known as wildlife conservation. ■

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