

WHAT IS FRAGMENTATION?

Fragmentation occurs when large blocks of wildlife habitats are divided into smaller and smaller pieces. Such development patterns diminish the functional integrity of habitats. For example, forests are cleared for roads and house lots, meadows become lawns.

Special natural features, such as vernal pools and core forests, which are needed by many native plant and animal species, may be degraded, eliminated, or made inaccessible.

In our forested areas, when fragmentation occurs repeatedly over the years, the remaining forest becomes so small that it ceases to function as a “core forest” and is simply a bunch of trees, unable to support a diverse ecosystem (see the reverse side for information about forest fragmentation and its impact on our wildlife).

WHAT IS A CORE FOREST?

A core forest is defined as the uninterrupted area of forest beginning at least 330 feet from any developed area (road, house, driveway, lawn, field). Core forests provide **interior forest** habitats, which are required by many of our more reclusive wildlife species.

Songbirds, such as ovenbirds, tanagers, and black-throated blue warblers, require at least 500 acres of core forest, while moose require 30,000 acres. The large area of habitats needed by wide-ranging animals can encompass many smaller core forest areas but requires that connecting corridors link the core forests.

FOR MORE INFORMATION ON FRAGMENTATION VISIT:

Forest Matters:

www.fs.fed.us/na/durham/coopforest/stewardship/pdf/05spring_stewardship.pdf

Today's Forest Tomorrow's Legacy:

www.uri.edu/ce/wq/has/html/has_woodscaping.html

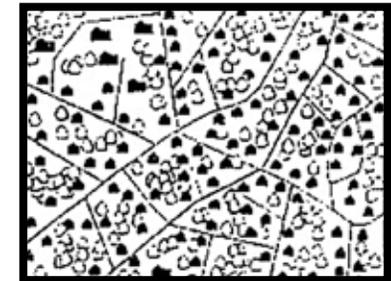
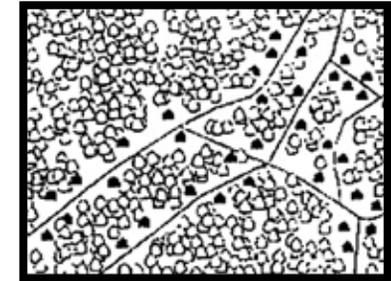
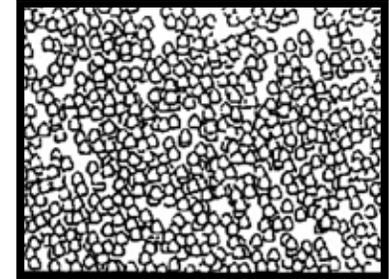
Northern Woodlands booklet, *The Place You Call Home: A Guide to Caring For Your Land in the Upper Valley*:

www.northernwoodlands.org

Forest quality and current threats: core or continuous forest:

http://www.dcnr.state.pa.us/wlhabitat/forest/forest_quality.aspx

CONSERVATION NOTES FRAGMENTATION & WILDLIFE HABITAT



DEVELOPMENT PATTERNS SHOW
INCREASING FRAGMENTATION

A PDF of this brochure can be downloaded from the following site:

<http://www.hartford-vt.org/content/conservation/>

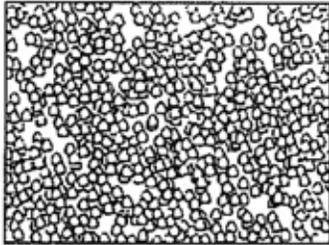
HARTFORD
CONSERVATION
COMMISSION

FRAGMENTATION AND ITS IMPACT ON WILDLIFE

A Maine task force investigating sprawl's effects on wildlife examined the relationship between habitat fragmentation and the presence or absence of selected wildlife species. The fragmentation drawings in this table depict different points on a developmental sprawl continuum. In the column below each drawing is a list of some species that usually reside in different sized forest blocks. As the forests become fragmented into smaller and smaller pieces, the list shrinks to fewer and fewer of those species. This illustrated table is adapted from one in the book "Above and Beyond", by Campoli, J., E. Humstone and A. MacLean (2002). The species lists are not absolute; some of

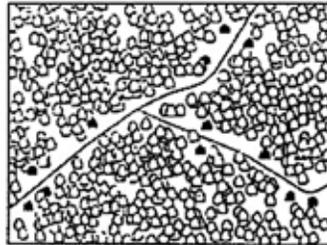
these species can survive in smaller forest fragments than illustrated, depending on other conditions, such as food availability and tolerance of human activities. Sometimes species requiring the largest of forests will use, and perhaps even become habituated to, fragmented areas, if they can move freely back to the larger forests. In areas where large forests have not or cannot be protected, preserving the connective corridors through which wildlife species move is critically important. Undisturbed ridgelines, wetlands and riparian corridors provide wildlife a chance for survival in a landscape experiencing development because these landscape features can connect crucial habitats.

Undeveloped



raccoon
snowshoe hare
porcupine
bobcat
cottontail
beaver
black bear
squirrel
weasel
mink
fisher
woodchuck
muskrat
moose
red fox
sharp-shinned hawk
bald eagle
skunk
cooper's hawk
harrier
broad-winged hawk
goshawk
red-tailed hawk
great horned owl
raven
barred owl
osprey
turkey vulture
turkey
garter snake
ring-neck snake
wood frog

500-2500 acre blocks



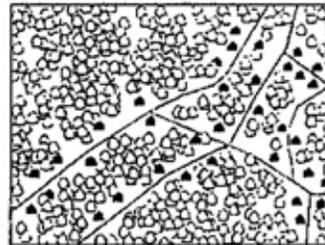
raccoon
snowshoe hare
porcupine

cottontail
beaver

squirrel
weasel
mink

woodchuck
muskrat
moose
red fox
sharp-shinned hawk
bald eagle
skunk
cooper's hawk
harrier
broad-winged hawk
goshawk
red-tailed hawk
great horned owl
raven
barred owl
osprey
turkey vulture
turkey
garter snake
ring-neck snake
wood frog

100-500 acre blocks



raccoon
snowshoe hare
porcupine

cottontail
beaver

squirrel
weasel
mink

woodchuck
muskrat

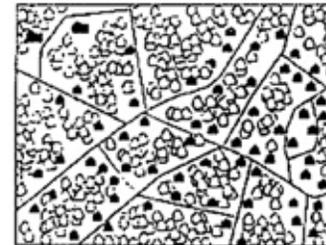
red fox
sharp-shinned hawk

skunk
cooper's hawk
harrier
broad-winged hawk

great horned owl

barred owl
osprey
turkey vulture
turkey
garter snake
ring-neck snake
wood frog

20-100 acre blocks



raccoon
snowshoe hare
porcupine

cottontail
beaver

squirrel
weasel

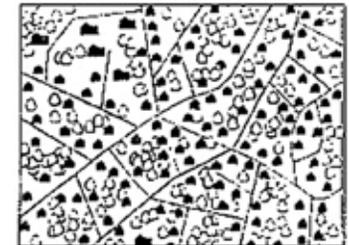
woodchuck
muskrat

red fox

skunk

garter snake
ring-neck snake

1-20 acre blocks



raccoon

cottontail
beaver

squirrel

muskrat

red fox

skunk

MAINTAINING WILDLIFE HABITAT AND CONNECTIVITY

One of the thrills of living in our area is seeing wildlife as it moves through the landscape from one habitat type to another, perhaps feeding on wetland plants in the spring, nuts and berries from uplands in the summer and fall, and retreating to coniferous forests for the winter. For the most part, animals still successfully travel between these different habitats. However, with most land in the region privately owned and subject to development, it's up to individual landowners to keep wildlife habitats diverse, intact, interconnected, and accessible.

Our wildlife populations depend on maintaining habitat (minimizing fragmentation) and connectivity among habitats (wildlife corridors).

WHAT CAN WE DO TO MINIMIZE FRAGMENTATION?

Whether you own 1 acre or 1000 acres, there are many ways to minimize fragmentation and retain wildlife habitat.

- **Place buildings close to the road** and not in the middle of the fields or forest.
- **Cluster buildings** near one another to minimize driveways and maximize unfragmented wildlife habitat
- **Consider wildlife habitats** when managing your land.
- **Work with neighbors** and neighboring communities to provide and protect core wildlife habitat and connecting travel corridors vital to far-roaming species.
- **Consider long-term protection**, placing a deed restriction or conservation easement on all or a portion of your land to permanently protect wildlife habitat by limiting future development.

WILDLIFE HOME RANGE AVERAGES

The table lists average home ranges for some of our region's largest mammals.* The home range acreages are significant portions of our towns and they exceed the size of most unfragmented forest habitat blocks in our area. Because these mammals are occasionally seen locally, we must assume that there is at least some connectivity between large forest-habitat blocks.

*Home ranges shown in the table represent the acreage required by one animal, calculated from the average of male and female home ranges using data from New England Wildlife: Habitat, Natural History, and Distribution (DeGraaf, R.M. and M. Yamasaki 2001.

Wildlife Species	Average Home Range Estimate (acres)	Approximate Percent of a Town's Acreage*
Moose	30,147	110%
Black Bear	23,897	87%
Bobcat	11,456	42%
Fisher	7,574	28%
Gray Fox	1,920	7%

*Average Vermont Town = 27,500 acres

WHAT CAN WE DO TO MAINTAIN WILDLIFE CORRIDORS?

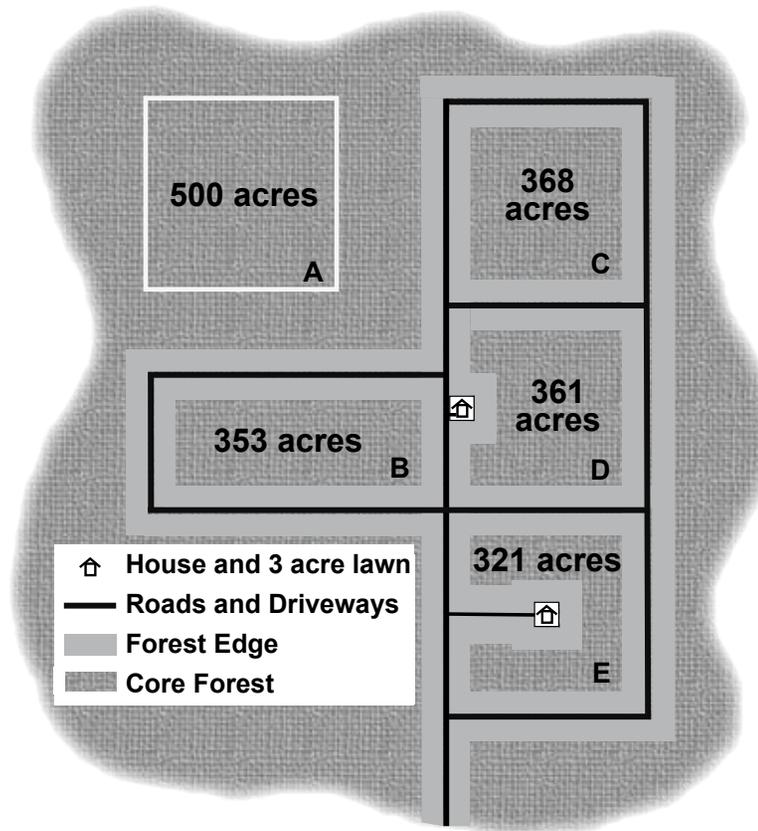
Wildlife corridors are patches or strips of forested land that link different habitats. Here are some ways to provide and enhance wildlife habitat connectivity:

- **The wider the corridor, the better.** An optimum width of 1000+ feet will provide a corridor for all wildlife. However, broad strips of forest between development, or even shrub thickets and hedgerows can provide some wildlife with protection and the means for movement across the landscape.
- **Maintain and enhance riparian buffers** (native trees, shrubs, and grasses along streams and wetlands) to provide protected wildlife travel corridors, feeding, and nesting areas.
- **Work with neighbors to coordinate corridors** from one parcel to another.
- **Encourage your forester** to coordinate their management plan's wildlife habitat and corridors with foresters working on adjacent parcels.
- **Drainage culverts under roads** are often used by wildlife such as fox, fisher, and bobcat. Leaving forested areas on each side of the road leading to the culvert will provide animals continued safe passage under the road.
- **New drainage culverts** should be oversized to provide passage for larger animals.
- **Use box culverts over streams.** They provide dry land on either side of the stream with additional height and can be used as a wildlife crossing under the road for larger animals.

FOR WILDLIFE DEPENDENT ON INTERIOR FOREST HABITATS, THE **BIGGER** THE CORE FOREST THE BETTER!

The shape that a forest acquires through fragmentation is an important determinant of core forest size and its functional integrity. Circular or square forested areas provide the greatest amount of core forest habitat. See the examples at right.

- Each forested block is comprised of 500 acres. The undeveloped forest block (A) surrounded by only forest contains 500 acres of core forest.
- Blocks B, C, D, and E are surrounded by roads; blocks D and E also have houses situated on 3 acres of lawn.
- The square block (C) has 368 acres of core forest while the rectangular block (B) has less.
- The square block (D) with a house near the road has 361 acres of core forest while the square block (E) with the house in the middle has much less.



As the examples show, the more rectangular forest block (B) and the block fragmented with a long driveway (E) possess less core forest.

WHY? Blocks B and E possess more forest edge.

Forest edge is the area of forest within 330 feet of developed areas. The forest edge is home to animals that are adapted to living near humans as well as being predators of forest interior species. Examples include cowbirds, raccoons, pet dogs, and domestic cats.

FOREST FRAGMENTATION WHY DOES IT MATTER?

- In highly fragmented forests, forest edge predators can threaten the survival of forest interior species.
- Fragmentation can prevent or limit access to important habitats such as wetlands, denning areas, and feeding areas making it harder for wildlife to survive and reproduce.
- Fragmentation can lead also to isolated, and therefore inbred, populations of wildlife, which weakens the species and may threaten their long-term survival.

The negative effects of fragmentation can be lessened by maintaining forested corridors that allow for a network of connectivity among core forest blocks (see reverse side).

WHAT DO CORE FORESTS PROVIDE?

Core forests with linking corridors provide wildlife access to essentials: **food, water, cover, space, and breeding areas**. But not only wildlife benefit from core forests.

We do too — because core forests provide:

- Clean air, clean water, flood protection, and ground water recharge
- Forest and agriculture-based businesses and future land management options
- Open space for solitude and for diverse recreational pursuits, such as hiking, hunting, cross-country skiing, and birding