

of the field work for the upland and wetland natural community inventories. No populations of rare species were recorded during these surveys.

6.0 Wildlife Habitat

Wildlife Habitat in the Mad River Valley is a diverse and constantly changing mosaic on the landscape. Wildlife habitat can be a woodlot in the village or hedgerow in the farm fields; these and all other wildlife habitats are influenced by natural processes and human development activities. Some wildlife habitat elements, such as vernal pools, have distinct boundaries around them. Other wildlife habitat elements such as Bicknell's thrush habitat in early successional montane spruce-fir forests are patchy and dynamic and therefore harder to put within boundaries that are temporally meaningful.

In this investigation and report, the larger Contiguous Wildlife Habitat Units serve as the starting unit of measure and description. Within each of these areas are described core habitat (remote from most human activities), wetlands, forested riparian areas and other habitat types where wildlife live and reproduce. These are meaningful in terms of individual species habitats (such as deer and deer wintering habitat, and bear and beech stands) as well as management of these areas by people in the Mad River Valley.

Below is a descriptive analysis of the wildlife habitat elements assessed (on the ground and remotely) and following the descriptions, a discussion of the Contiguous Wildlife Habitat Units themselves.

Description of Wildlife Habitat Features

Core Area

Core habitat is forested wildlife habitat that is far removed from human activities and their artifacts such as roads, houses, and active farmlands. This remote wildlife habitat is qualitatively distinct from small fragmented areas in that it provides important mating, nesting, feeding, and denning habitats for species that cannot survive in more fragmented landscapes. These animals also require travel corridors between various landscape patches that provide these elements.

A wide-variety of birdlife in the northeast utilizes the larger contiguous forests available only in core areas. These birds include species such as the broad-winged and red-shouldered hawks, owls, and forest songbirds like the ovenbird, wood thrush, scarlet tanager, pileated woodpecker, and the Canada and black and white warblers. Several of these species suffer from greater nest predation (by animals such as squirrels, raccoons, snakes and other birds) and nest parasitism (by other birds such as the brown-headed cowbird) where nesting grounds are near human disturbance. Bird populations throughout the Mad River Valley, therefore, benefit from the deep forest "interior" habitat provided by core areas, see Figure 10 for core locations.

Remote wildlife habitat found in core areas can provide the various habitat elements for wide-ranging species such as fisher, bobcat, and black bear. Core areas are often hilly or mountainous, without easy access, and only rarely or seasonally visited by landowners, hunters, and loggers. Wide ranging species thrive in the remote habitat of the core areas.

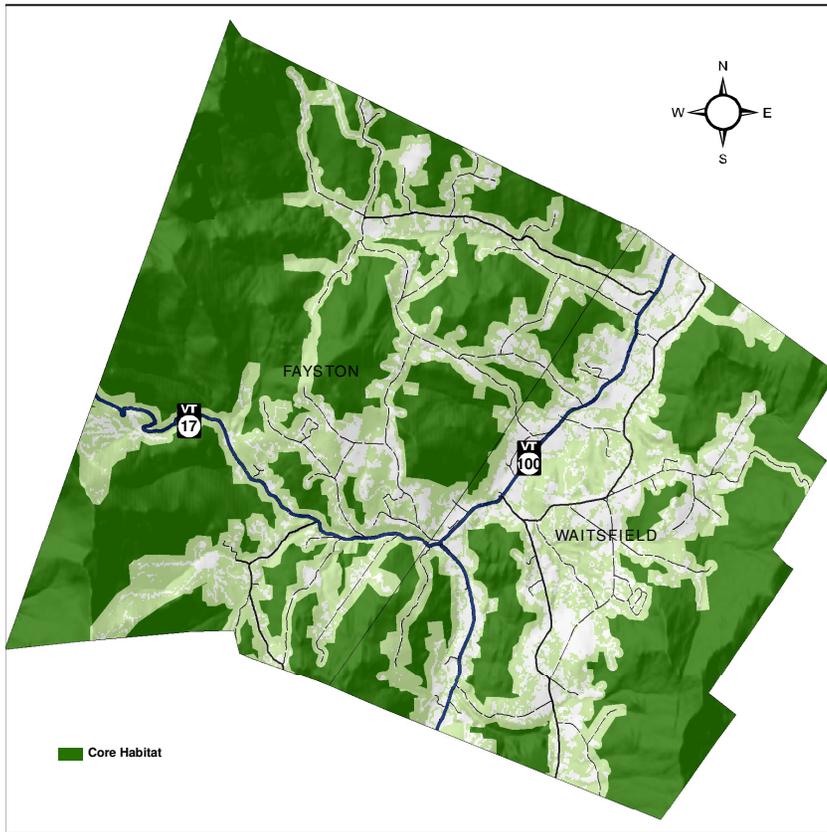


Figure 10. Core Habitat Map

Core areas are often the most important “source areas” where reproductively active female bear, bobcat, fisher, and coyote have their young and contribute to the overall population of these species. In general, the larger the core area size, the greater the population (and territories) of individual species it can support. Larger populations are generally more stable over longer periods. Core areas often provide the breeding grounds and nurseries that support relatively high populations of these deep forest species. Although most human wildlife observations may be near town,

within our small woodlots and crossing roads, it is these core areas that produce a surplus of young and without them populations would likely go into decline.

Approximately 30,700 acres of core habitat were identified within the study area.

Horizontal Diversity

Horizontal diversity is a measure of the change in vegetative types across an area of undeveloped land (i.e., core areas). These patterns or changes can result from differing bedrock and soil types, or past land use or management activities.

In general, the greater the change in vegetative diversity across a core area, the greater the overall species diversity of animals within that area. This applies most directly to mammals, such as fox, coyote, deer, moose and black bear, but horizontal diversity is also applicable to bird species. Mammals and birds often need different vegetative structure and species composition to fulfill various habitat needs. For instance taller trees may be needed for nesting activity of a bird while the preponderance of the feeding activities of this bird may be on smaller saplings or shrubs. Black bear may utilize mid to older American beech trees for fall feeding and then travel to beaver-dam wetlands for spring and summer feeding and utilize areas of dense cover for travel corridors. A wide variety of habitat types can translate into more prey opportunities for predators.

When species specific habitat features on the landscape are not otherwise limiting an increase in horizontal diversity usually produces an increase in mammalian and bird species diversity.

Ledge, Talus and Cliff Habitat

Ledge habitat is generally associated with steep land and vertical rock structure. Vertical rock structure itself is only valued in the Mad River Valley by a limited number of species such as nesting peregrine falcon, common ravens, and the small-footed bat. If the ledge is broken, that is, with crevices, hollows and caves it becomes important habitat for a wide-variety of animals. Porcupines and raccoons live in hollows, under larger rocks, and in deeper cave-like structures in ledge and talus environments. Fisher and coyote often use these sites for protection from the weather while moving throughout their home ranges. Ruffed grouse and small rodents often utilize these areas. In many areas throughout the northeast, bobcats use ledges for courting and breeding grounds and the broken ledge (often at the foot of a ledge) for birthing and rearing of their young.



Figure 11.
Talus pile at the base of ledges

Broken ledge is considered defensible from predators like the coyote that may try to kill and eat bobcat young. Bobcats are reported to also utilize broken ledge (similar to coyote and fisher) when it's cold and snowy as well as when it's hot (for relief from the heat). There is some evidence that ledges facing south and west (areas that generally are more exposed to the sun) may receive higher use by certain species and are more valuable to wildlife.

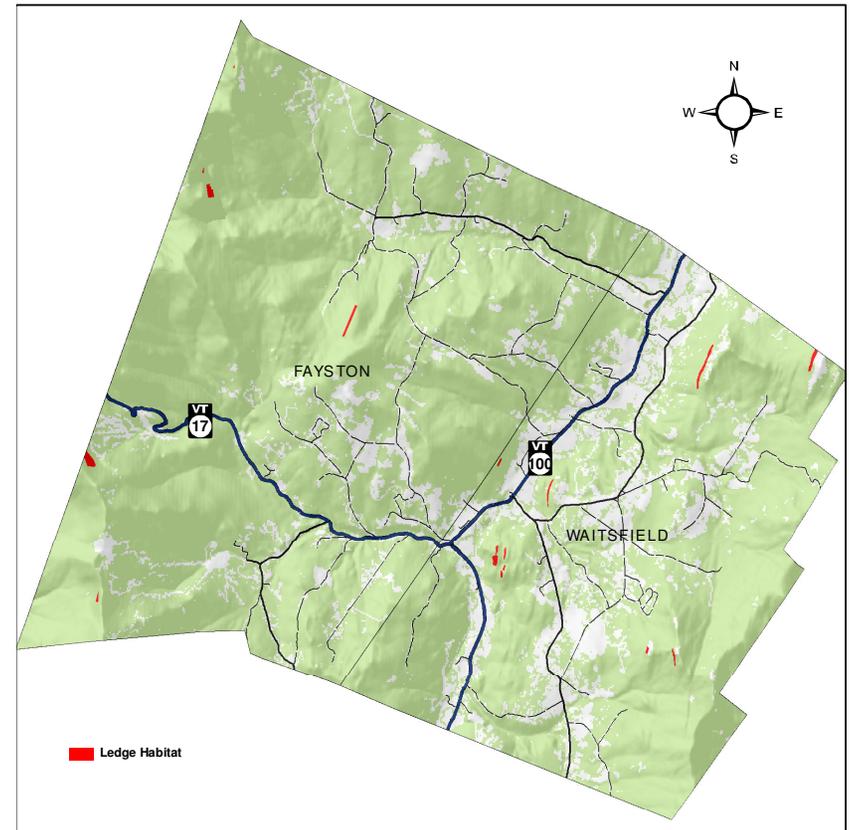


Figure 12. Ledge Habitat Map

18 ledge or talus areas were identified, and more are likely to exist within the study area.

Bear Wetlands

Black bear utilize a wide variety of wetlands during the spring and summer months. Forested, shrubby, beaver-flow wetlands, and forested seeps are sought out for the flush of early leafy

vegetation that often grows in these environments. In the early spring, wetlands with ground-water discharge promote an early growth of leafy green vegetation at a time when the trees are still barren of nutritious buds and new leaves. Black bears (as well as deer and turkeys among other animals) will utilize this food source and also search out plant roots, grasses, sedges and ants in these environments. Free flowing water is also available at many of these wetlands. Bear wetlands typically have shrubs or tree vegetation nearby which provide cover.

Throughout the Mad River Valley remote forested seeps are probably the most heavily utilized wetlands by bear. As such, they warrant special protection for their wildlife value.

The 118 wetlands identified as preferential bear habitat in this study represent a mix of wetlands that were observed in the field to have either 1) sign of bear use or 2) fulfill bear wetland habitat requirement (i.e. sufficient cover for bear use and potential food resources). See Figure 14 for Bear Wetlands Map.

Early Successional Habitat (ESH)

ESH is forested habitat that is characterized by young, often dense shrubs, saplings or trees. Active forest management or natural disturbances such as disease infestation, ice storms, or wind blow can create a new growth of woody vegetation. Old fields with a substantial shrub



Figure 13. Logging clear-cut creating early succession habitat

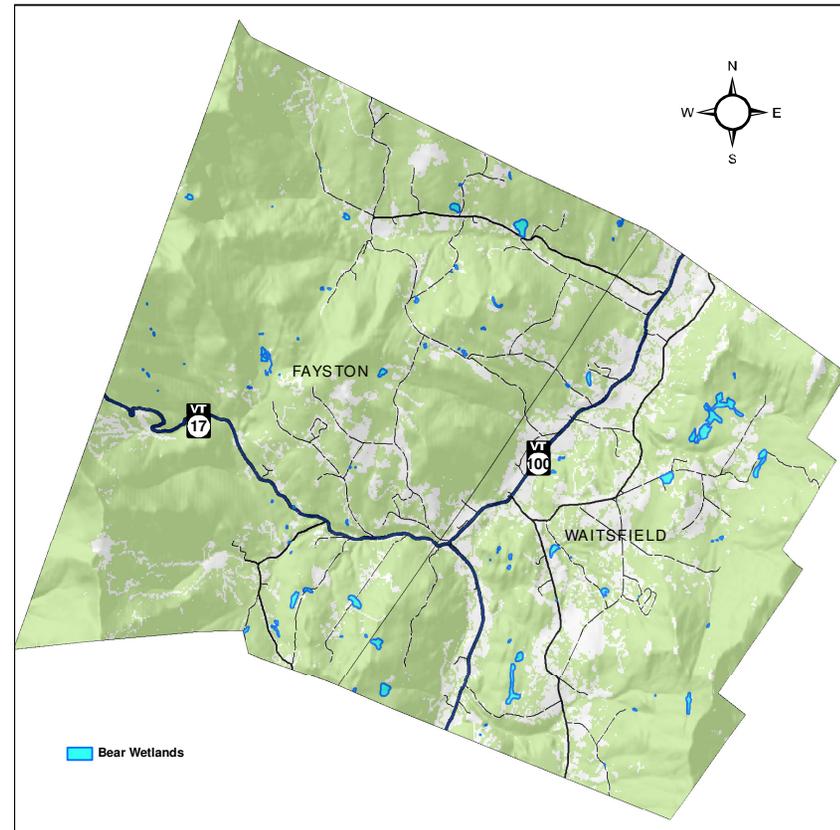


Figure 14. Bear Wetlands Map

component were also identified as ESH in this study. ESHs are important for many species of birds and mammals. Bird species that thrive in areas with tree saplings and shrubs include: the song sparrow and field sparrow, chestnut-sided and golden-winged warbler (rare), common yellowthroat, gray catbird, indigo bunting, brown thrashers, veery, American woodcock, and ruffed grouse.

ESH that is interspersed with older forestland, old fields, and wetlands harbors many small mammals that are prey for

predators. Snowshoe hare, woodchucks, white-footed and woodland jumping mice, and shrews are often found in high densities in areas of successional patches on the landscape. Red and gray fox, coyote, ermine, skunk, raccoon, and bobcat will search these patches for food. Black bears and other animals will utilize these areas extensively in years when berry-producing shrubs are thick with berries.

Approximately 1500 acres of ESH were identified in the study area.

Forested Riparian Habitat

Forested streamside riparian habitats are important for species that utilize the aquatic habitats, terrestrial vegetation and cover that are provided. Riparian forested vegetation anchors the stream shoreline and limits streambank erosion. It also provides shade and provides coarse woody debris to streams that adds to the stream structural and substrate diversity as well as provides food that fuels stream food chains.

Amphibians such as the green frog and the Northern dusky salamander live along streams in forested habitat and utilize the adjacent riparian environment. The raccoon and long-tailed weasel use streamside forested habitats to hunt for food and for denning habitat. The moose and white-tailed deer use streams and streamside forested habitats for cover and water. Aquatic animals such as the river otter and beaver use streamside vegetation for cover, denning and food. Several species of bats such as the little brown myotis and the big brown bat use these environments to hunt for insects. Birds such as the belted kingfisher, wood duck, red-shouldered hawk, snipe, Eastern screech and barred owl, the wood pee-wee and alder flycatcher, American gold finch, tufted titmouse, and the yellow, Canada,

and cerulean warblers make extensive use of forested riparian habitats.

There are approximately 372 kilometers of river and stream mapped in the two towns, and just over 6000 acres of forested riparian habitat was identified.

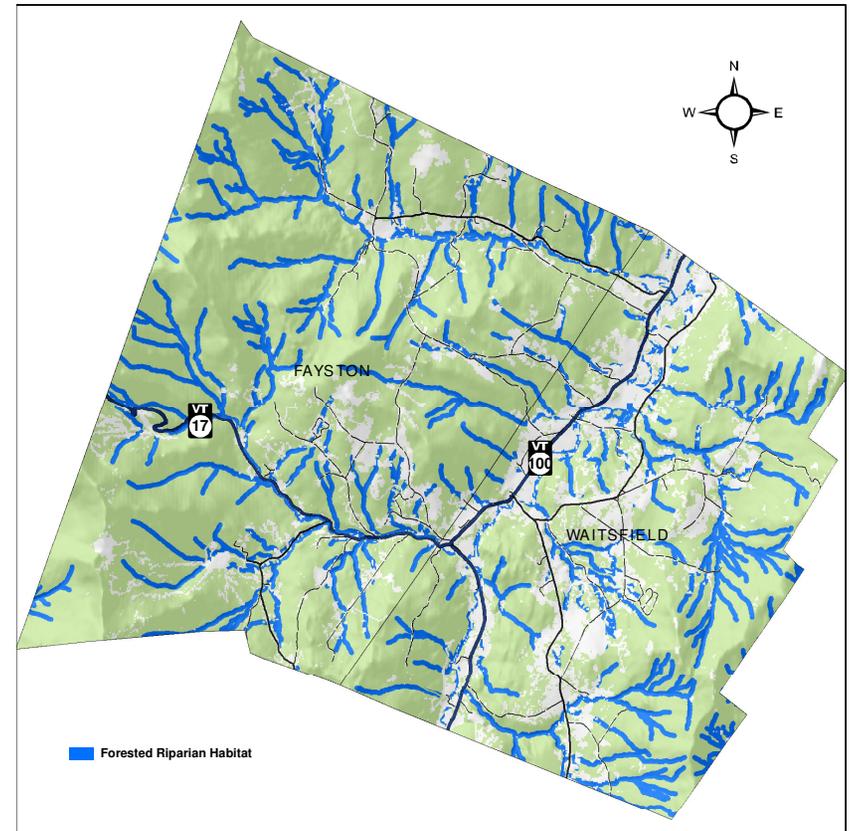


Figure 15. Forested Riparian Habitat Map

Deer Winter Habitats

In years where significant amounts of snow accumulate in the woods, white-tailed deer utilize evergreen forests for habitat. Evergreen trees intercept snow as it falls to the ground generally resulting in shallower snow depths. These habitats offer an overhead canopy of needles that shield deer from the cold. Deer congregate in these areas when snow depths exceed about 15 inches and remain until the snow melts in spring. These winter habitats can be critical in limiting the energy expenditures of deer

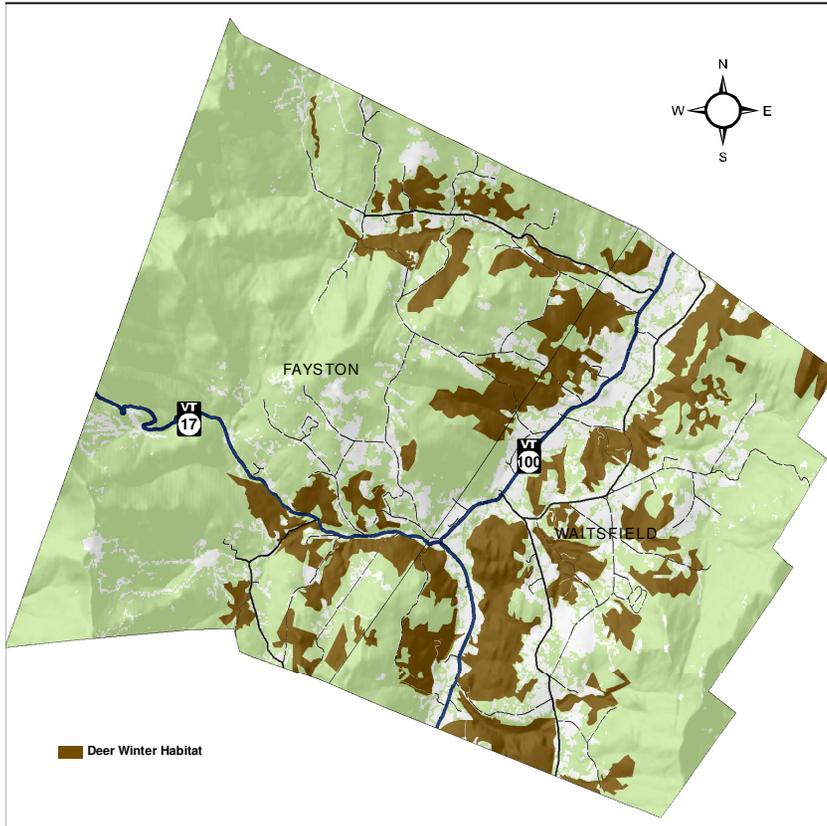


Figure 16. Deer Winter Habitat Map

and supporting the overall survival of this species in the north.

Deer winter habitat that faces into the sun (either west or south) is often more valuable than east or north facing areas. Eastern hemlock, balsam fir, and Northern white-cedar stands provide the best cover and food value to deer, but pine and spruce will sometimes be utilized. These deer winter habitats are also home to bobcat, coyote, and scavenging bears that come looking for live deer to eat during the winter or carrion to scavenge in spring. Other animals such as evergreen-loving birds, porcupines and fox utilize these habitats during other seasons.

AE mapped 7200 acres of deer winter habitat in the study area, the State of Vermont had previously mapped 5800 acres.

Mast Stands

Masting trees are those which synchronize fruit production in an area. In the Mad River Valley, masting trees are Northern red oak and American beech trees. Both of these trees, when found clumped into stands are regularly visited by many species of wildlife.



Figure 17. Bear claw marks on a beech tree

Some of these stands are very large, such as the Slide Brook beech stand in Fayston and Warren which is several hundred acres in size and other areas are 20-30 trees in extent. When beech and oak stands are remote, use by black bear is generally

higher than stands near human activities. Wildlife attracted to the fruits of American beech (beechnuts) and Northern red oak (acorns) include squirrels, wild turkey, deer, and bear.

Bear will climb the trees in fall to gather beechnuts, leaving scars from their climbing activities. They often return in spring and scavenge beechnuts from the ground under the beech trees. Bears act in a similar fashion in search of acorns, however, their climbing activities do not usually leave persistent scars and their use is therefore difficult to detect on the tree itself.

22 mast stands were identified in the study area, 9 of which were confirmed for bear use in the field.

Grassland Habitat

Grassland habitats are open areas that are in hay or natural meadow vegetation. Some grassland habitats alternate from year to year with row crops. In years when they are not in row crops they are utilized by a wide variety of wildlife including: birds, red fox, coyote, deer and woodchucks. Some species such as deer, fox and bear will use these areas even while in row crops.

While in meadow vegetation (largely grasses and sedges) deer will graze and red fox will hunt in these habitats. Several species of grassland birds live and breed only in this type of meadow habitat including: the upland sandpiper, grasshopper sparrow, sedge wren, Henslow's sparrow, bobolink, the vesper and savannah sparrow, and the Eastern meadowlark. Grassland habitat units of greater than 25 acres in size are important breeding habitats for many of these grassland species.

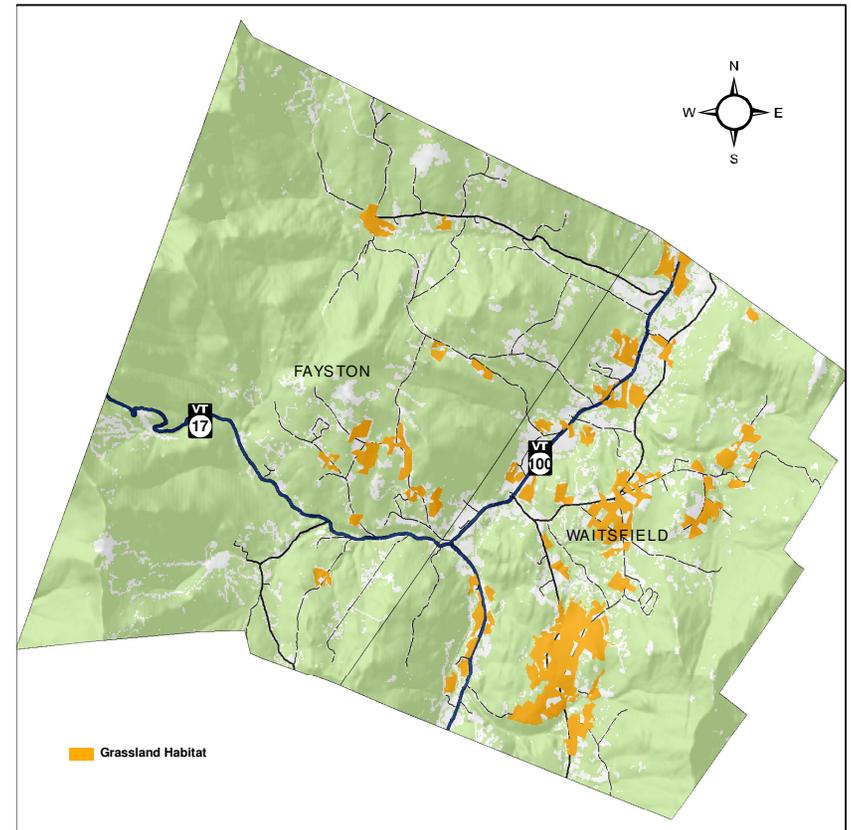


Figure 18. Grassland Habitat Map

Wetlands

Wetlands are habitats that are transitional between aquatic habitats and terrestrial habitats. Wetlands are a combination of hydric soils, hydrophytic plants, and the presence of water itself.

Wetlands associated with water bodies provide habitat for muskrat, river otter, mink, moose and deer, fisher and bobcat,

raccoon, spawning fish, and birdlife such as herons, ducks, geese, shorebirds, northern harriers, and a wide variety of songbirds.

Forested swamps are visited by over-wintering deer, bear, fisher, raccoons and coyotes, as well as other species of wildlife. Prey species (such as snowshoe hares and mice) can be common in wetlands and thus they are attractive to predators. Sedges and other broad-leaved herbaceous plants support a rich food chain that herbivores such as deer and moose enjoy.

Wetlands that contain open water (but not fish) can serve as breeding habitat for a variety of frogs and salamanders. Many wetlands are breeding grounds for the insects that amphibians eat. The Wetlands Inventory Map created for this study is included in the Appendix.

Travel Corridors

Travel corridors are places where landscape and land use characteristics combine to form an area where wildlife can move across roads to and from habitat areas. Many species of wildlife utilize a diversity of different habitat and plant community types within their home ranges (or territories). Wildlife move across the landscape for a variety of reasons but generally they move in search of new territories, food resources, and/or potential mates.

A good example to illustrate seasonal wildlife movements is that of the black bear in Vermont. The black bear typically moves in spring from its high, remote denning areas to wetlands (often forested seeps) lower on the landscape. In summer bear will seek berry patches in openings and along old logging roads within the forest. In fall, bears will move to beech stands, orchards, or possibly corn fields depending on the availability of natural foods in the forest.

General wildlife corridors for wide ranging species are shown on Figure 19. In addition to these general corridors, the presence of more specific habitat elements allowed for the mapping of potential species specific corridors for bear and deer. Finally, travel corridors for amphibians moving from upland to wetland habitats were determined based on location of roads and available habitats.

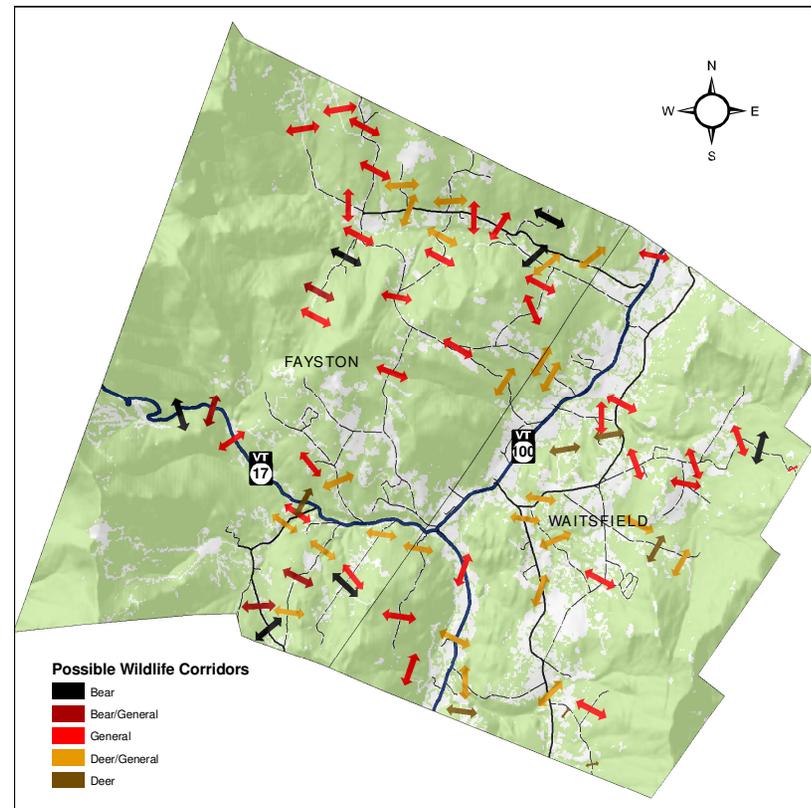


Figure 19. Possible Wildlife Corridors Map

Detailed discussion of corridor assessment methodology is provided in Appendix 1, Section G. Discussed here are the results of the corridor assessment, focused on the three areas listed above.

General Wide Ranging Mammal & Species Specific Corridors

A total of 76 potential corridors were identified within the study area. Seven of these potential corridors are specific to bear movements, seven are specific to deer movements and the remainder to deer, bear, bobcat and other wide ranging species. As mentioned in the methodology (Appendix 1, Section G) these corridors were not field verified or assessed.

Many of the wide ranging wildlife corridors identified in this project are located within areas of limited development and contain large, significant habitat features in close proximity to the corridors. As would be expected, wide ranging mammals are likely to find these areas most preferential as movement zones due to the lack of human disturbance and the necessities of moving between critical food, cover and/or other habitats.

There were relatively few probable corridors identified crossing the more developed areas of the study area such as the Mad River valley, Route 17, German Flats Road or the East Warren Road. The limited opportunities for wildlife travel in these developed areas highlight the importance of maintaining and improving what already exists for movement corridors within these areas.

These probable corridors should be field verified and, if used by wildlife, should be considered as high conservation and protection priorities.

In the Mad River valley bottom, the opportunities for movement are severely limited by development and agricultural lands. Some contiguous habitat units (discussed below), such as #15 and #25 offer wildlife very limited ingress or egress options. These areas risk becoming biological islands or population sinks for wildlife if no movement corridors continue to exist, wildlife populations die off, and no new animals can repopulate the area from adjacent wildlands.

Improvement and expansion of the vegetated buffer conditions of both the Mad River and the tributaries feeding it would greatly assist in providing travel corridors across and within this area without putting undue burden on agricultural or development activities. Finally, opportunities for passage structures under the heavily traveled roads such as Route 100 should be sought, especially in those areas where further field work suggests wildlife movements are concentrated.

Land conservation of connecting lands, in conjunction with improved riparian buffers and structures that provide wildlife safe travel, will aid in maintaining a healthy and diverse wildlife population throughout the area.

Amphibian Road Crossing Zones

Many busy roads bisect amphibian travel corridors and amphibians are forced to cross roads to get from their upland forest habitat to the breeding habitat in the vernal pools and wetlands. Thirty-one potential amphibian road crossings have been identified in the study area. None of these sites have been field verified. Field verification requires monitoring these road crossing sites during spring migration of the vernal pool amphibians. By knowing the location of the crossings,

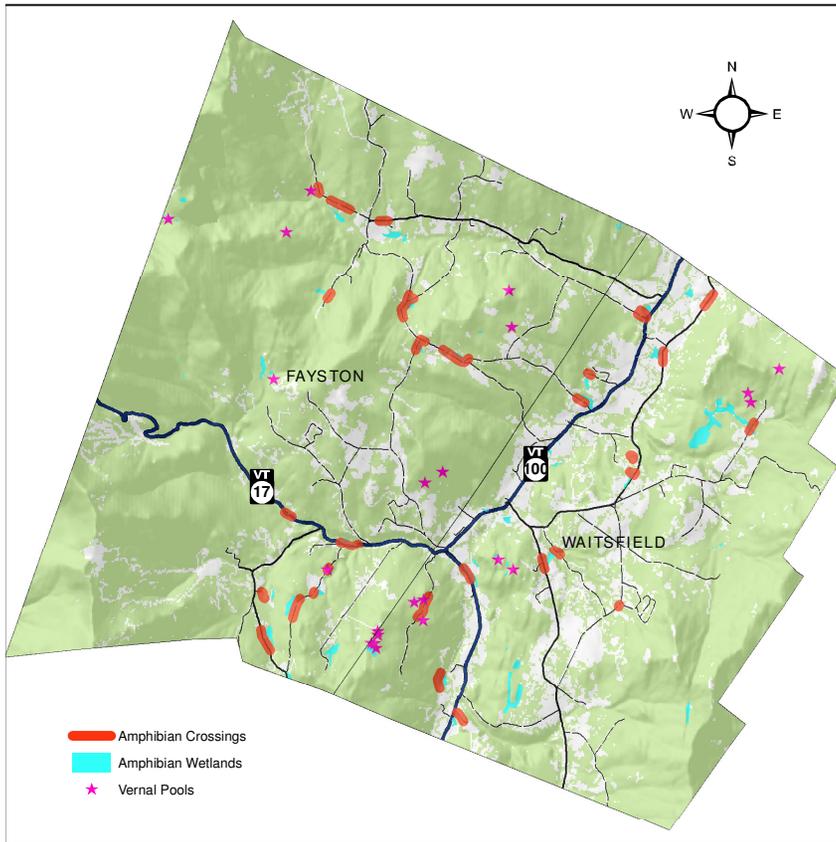


Figure 20. Amphibian Crossing Zones

townspeople can be made aware that they should drive with care during the migration time. Some towns have organized volunteers to be out on nights of the migration to warn drivers and assist amphibians crossing the roads. Other towns have obtained signage to erect near the sites of the highest amphibian mortality.

Forested travel corridors between forest and vernal pool habitat should be maintained to facilitate migration of pool breeding

amphibians. Barriers to amphibian movement such as busy roads, large clearings, or intensive development should be avoided or minimized within these amphibian travel corridors. Small developments (e.g. a single family house), yards, and infrequently traveled dirt roads are often not a major barrier to amphibian movement but may decrease migration success and habitat availability on a meta-population level.

Travel pathways that allow these movements are critical for animals that have habitat requirements in distant places and these pathways help maintain the genetic variability of various species of wildlife including: bear, bobcat, coyote and fox, fisher, deer and moose and some amphibians.

Contiguous Habitat Units (CHUs)

Contiguous Habitat Units are a combination of several different wildlife habitat types combined to form a unit of relatively continuous wildlife habitat. The largest forested area, often the most valuable wildlife habitat is the core area (largely free from most human activities). In constructing CHUs the core areas are combined with early succession habitats, forested riparian habitats, wetlands, deer wintering habitat, mast stands, and ledge or cliff habitats. In some cases, these specific wildlife habitat features (like riparian areas) may not add new area (they are already subsumed within the core area boundary) to the already mapped central core, while in other cases (when they are tangential but not within the mapped core area) they add new area and additional acreage to the CHU.

A total of 28 contiguous wildlife habitat units (CHUs) were identified in the two town study area, see Appendix 1, Section E for methodology. The 28 CHUs comprise a total land area of 27,578 acres, of which 21,756 acres is considered core habitat.

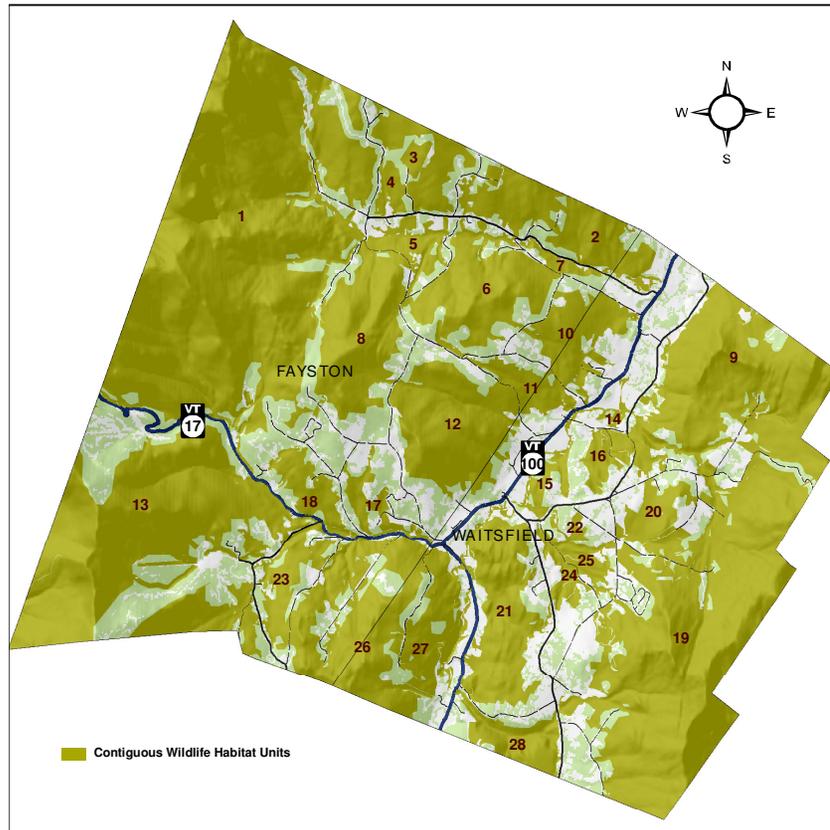


Figure 21. Contiguous Habitat Units Map

Within the CHUs, approximately 7,164 acres of Deer Winter Habitat has been identified and mapped. Mast stands were identified in 10 of the CHUs. A summary data table is provided in Appendix 2 detailing the individual habitat elements within all the CHUs. A discussion of the most significant CHUs is provided below.

CHU# 1

General Habitat Information

- 6376 acres total
- 6068 acres core habitat
- 1906' mean elevation
- Low horizontal diversity

Specific Wildlife Features

CHU1 has the largest core area in the study area and extends over the mountains into Huntington and Buell's Gore. Mast stands and forested wetlands are present and important for the productivity and maintenance of black bear and other deep forest species populations. Ledge habitat is also present in this unit. CHU1 has 26 miles of stream habitat and generally well-vegetated and topographically incised stream valleys which add to their value and use as wildlife movement corridors. This unit has several vernal pools (generally lower on the landscape) and contains substantial areas over 2700 feet in elevation with potential Bicknell's Thrush and other high-elevation songbird habitat. Other birds associated with this Montane Spruce-Fir habitat include: the blackpoll, bay-breasted and yellow-rumped warblers, ruby-crowned kinglet, and the olive-sided flycatcher. Just below this forest zone, the Montane Yellow Birch-Red Spruce Forest offers habitat for the winter wren, blackburnian and Canada warbler as well as the solitary vireo. Included in CHU1 is a portion of the Camels Hump State Park and Phen

Features Present:

core
deeryard
streams
wetlands
riparian
mast
ledge
bear wetland
vernal pool
significant community

Basin Wilderness area. This CHU1 is dominated by un-fragmented core forest.

CHU# 2

General Habitat Information

- 1367 acres total
- 1057 acres core habitat
- 1315' mean elevation
- Moderately low horizontal diversity

Specific Wildlife Features

CHU2 extends north into wild forested country in Duxbury and is close enough to CHU1 that wildlife probably moves readily between the two areas. CHU2 contains substantial areas of deer wintering habitat, early successional vegetation, and riparian/floodplain vegetation. With CHU2 containing both deeryard and early succession habitat, it is probably used by coyotes and other predators seeking food in these habitat types. The area has good potential habitat for black bears with beech stands present and wetlands that are appropriate for bear use. Signs of bear presence were noted during a field visit to the western finger of CHU2.

Features Present:
core
deeryard
streams
wetlands
early succession
riparian
mast
bear wetland
significant community

CHU2 contains areas that could be utilized by high-elevation songbirds, including potential habitat for Bicknell's thrush.

CHU# 9

General Habitat Information

- 2275 acres total
- 1783 acres core habitat
- 1326' mean elevation
- Moderately low horizontal diversity

Specific Wildlife Features

CHU9 has an extensive core area, substantial deer wintering habitat (with extensive sign of current use), and several large areas of wetland habitat. The observation of bear sign in wetlands at this site, the presence of mast stands and a substantial core area suggest that this unit is important to maintaining Waitsfield's bear productivity. CHU9 has ledge habitat, extensive forested riparian habitat as well as early successional wildlife habitat. CHU9 has vernal pools and a nice early succession balsam fir forest situated adjacent to a large streamside wetland complex where river otter, mink and bobcat sign were observed.

Features Present:
core
deeryard
streams
wetlands
early succession
riparian
mast
ledge
bear wetland
vernal pool
significant community

CHU# 26

General Habitat Information

- 1435 acres total
- 1050 acres core habitat
- 1468' mean elevation
- Moderately low horizontal diversity

Specific Wildlife Features

CHU 26 is perhaps most notable as the area with at least 6 identified vernal pools. These provide important breeding habitat for a diversity of vernal pool-dependent wildlife. Also present within this unit is extensive forested riparian habitat and many wetlands. Remote forested wetlands and recently climbed American beech trees attest to the value of this area to bear. This forest area is extensively managed and several patches of early succession vegetation provide good snowshoe hare, mice, and predator habitat. A portion of this unit includes a large Norway Spruce plantation, with impressive regeneration in the understory likely to provide significant habitat for a variety of species.

Features Present:

core
deeryard
streams
wetlands
early succession
riparian
bear wetland
vernal pool
significant community

CHU# 8

General Habitat Information

- 1093 acres total
- 984 acres core habitat
- 1783' mean elevation
- Moderately high horizontal diversity

Specific Wildlife Features

CHU8 is situated between the remote Big Basin area and several lower gradient forested areas. This unit has substantial areas of early successional vegetation resulting from active forest management activity, floodplain/riparian streamside forests, and ledge habitat that could provide important protective cover for bobcat and other animals. CHU8 may provide a role as an important forested landscape connection between the large remote habitat in Big Basin and the landscape closer to Route 100 and the village. The area has a high potential for bear habitat with the presence of mast stands and wetlands.

Features Present:

core
deeryard
streams
wetlands
early succession
riparian
mast
ledge
bear wetland
significant community

CHU# 12

General Habitat Information

- 1215 acres total
- 1042 acres core habitat
- 1415' mean elevation
- Moderately high horizontal diversity

Specific Wildlife Features

CHU12 has extensive deer winter habitat, areas of early successional habitat, and forested riparian habitat. Field observations suggest that deeryards in this unit were receiving moderate amounts of deer use (Natural Community

Features Present:

core
deeryard
streams
early succession
riparian
mast
ledge
vernal pool
significant community

#157). The area has a Northern red oak mast stand, vernal pools, and wetlands. CHU12 is likely used at least seasonally by bear.

CHU# 13

General Habitat Information

- 3436 acres total
- 3106 acres core habitat
- 2287' mean elevation
- Low horizontal diversity

Specific Wildlife Features

CHU13 has one of the largest core areas in the study area and includes ski area development. CHU13 has large areas of Montane Spruce-Fir Forest which likely provides breeding habitat for several species of warblers and other high elevation birds including Bicknell's thrush. Significant mast stands and forested wetlands are present.

Features Present:
 core
 deeryard
 streams
 wetlands
 early succession
 riparian
 mast
 ledge
 bear wetland
 significant community

The Slide Brook beech stand, one of the heaviest used beech stands known in Vermont, is partially contained within this unit. Black bear and other deep forest species likely use this area year-round. CHU13 also is contiguous with large forested habitat outside of the study area to the west. The area has several deer winter habitats, ledge habitat and extensive areas of forested riparian habitat.

CHU# 19

General Habitat Information

- 4145 acres total
- 3551 acres core habitat
- 1868' mean elevation
- High horizontal diversity

Specific Wildlife Features

CHU19 has a very large core area that extends across most of the higher elevations of Waitsfield and east into Northfield. CHU19 has the largest core area in Waitsfield and likely provides "source" habitat for bear, bobcat, fisher, coyote, moose and other mammals and birds. CHU 19 has a relatively high diversity of plant community types (i.e. a high horizontal diversity) and extensive areas of early successional habitat. This area likely contains year-round populations of black bear and other deep forest species. Field work indicated that mast stand #19 was not heavily utilized by bear either historically or recently.

Features Present:
 core
 deeryard
 streams
 wetlands
 early succession
 riparian
 mast
 ledge
 bear wetland
 significant community

CHU19 has extensive forested stream riparian areas. The unit includes a remote beaver-influenced wetland that likely is used by bears and other wildlife. Extensive deer sign was documented in the Hemlock Forest communities within this unit (Deer winter habitat #38).

Scragg Mountain and areas within the southern part of the unit have coniferous forest vegetation and may provide breeding

habitat for high elevation songbirds including the Bicknell's thrush.

CHU# 21

General Habitat Information

- 1043 acres total
- 702 acres core habitat
- 974' mean elevation
- Moderately high horizontal diversity

Specific Wildlife Features

Nearly the entire CHU21 is a Hemlock Forest Community mapped as deer winter habitat. The unit also contains extensive ledge habitat which may be of significance in providing, protective bobcat, raccoon, and porcupine denning habitat. Porcupine, and probable bobcat sign was noted within the ledge areas of this unit. Both the deer winter habitat and the potential ledge denning sites have western aspects and may be sunny and quite warm.

This increases their value as potential wildlife habitat. There are also extensive wetland and streamside forested riparian habitats within the unit that may be utilized by bear in spring and/or summer months. CHU21 also has vernal pools and perched Hemlock-Hardwood Swamps that offer important amphibian habitat.

Features Present:
core
deeryard
streams
wetlands
early succession
riparian
ledge
bear wetland
vernal pool
significant community

CHU# 6

General Habitat Information

- 1011 acres total
- 793 acres of core habitat
- 1429' mean elevation
- Moderately high horizontal diversity

Specific Wildlife Features

This Wildlife Unit has a substantial area of deer winter habitat, floodplain/riparian streamside habitat, and well as mast stands and wetlands with a high potential for bear use. American beech stands exhibited signs of both recent and historical use.

CHU6 also contains vernal pools and a locally significant wetland community. The area has diverse vegetation and several areas of heavy forest cutting resulting in berry patches which are likely used by wildlife. Extensive moose sign was observed in this area.

Features Present:
core
deeryard
streams
wetlands
early succession
riparian
mast
bear wetland
vernal pool
significant community

CHU# 28

General Habitat Information

- 367 acres total
- 230 acres of core habitat
- 1083' mean elevation
- Low horizontal diversity

Specific Wildlife Features

CHU 28 stretches into Warren in the south, but its forested extent is limited by the presence of farmlands. The area has extensive deer winter habitat (the Folsom Brook section is very steep and could also be a focus of wildlife movements across the Mad River and Route 100). This parcel extends uphill from Route 100 containing forested riparian habitats that provide winter deer habitat and wildlife movement possibilities.

Features Present:

core
deeryard
streams
wetlands
bear wetland

West-facing CHUs Dominated by Deer Winter Habitats

CHU's 16, 22, 24 and 28 are all relatively small habitat areas that are mapped almost entirely as deer winter habitat. In addition, they are all facing into the sun (largely south or west) resulting in a warmer microclimate than areas facing north or east. These relatively small areas may receive a disproportionately high use by wintering deer because of their favorable aspect. These areas require field verification of deer winter habitat use.

Wildlife Habitat in Smaller CHUs

Contiguous Wildlife Units 3, 4, 5, 7, 11, 14-17, 18, 22, 24, and 25 are small enough that core habitat is non-existent or relatively small in extent. These CHUs may contain special wildlife elements such as aquatic habitats, wetlands, ledges or special food plants that can be utilized by a wide-variety of wildlife species. In many cases these smaller forested habitats will not provide year-round habitat for larger species such as bear or moose, but these larger mammals may be utilizing these habitats seasonally. Animals such as woodchuck, red fox, skunk, raccoon, deer, snowshoe hare, mice, moles, voles, amphibians, reptiles and the more common bird species live in these smaller wildlife units. These areas are of greater value to wildlife when they have higher vegetative diversity, or special habitats such as ledges, vernal pools, ponds, and streams that connect them to other wildlife habitats.

Small Unit's can be important to animals traversing the landscape and moving between larger core areas. Smaller units (such as CHU 11, 16, 24, 25 and 28) can serve as travel corridors for these animals in transit. In some cases these relatively small forested units may link Fayston and Waitsfield with other nearby towns.

Habitat units 5, 10-11, 17-19, 23, 25, 27, and 28 have substantial areas of forested riparian habitat. These areas may be used by wildlife moving throughout the landscape. The cover provided by these forests is often dense and facilitates seasonal and annual migration by wildlife. Cover provided by riparian forests and other plant communities is utilized during wildlife movements and can help animals escape people, predators and other obstacles during this vulnerable period in an animal's cycle.

In other cases, these smaller forested areas may be near a population center with major roads and may provide for some opportunistic wildlife viewing opportunities. CHUs 10, 11, 14, 15, and 16 are forested areas populated areas near Route 100 and may serve a wildlife viewing function.

Small Wildlife Habitats in the Mad River Valley

Wildlife can be found throughout the Mad River Valley including near villages, and houses, in farm fields and along hedgerows and near small streams and woodlots. In the more agricultural settings, sightings of deer, red fox, skunk, groundhogs, and wild turkey are most likely a common occurrence. These same species are also occasionally spotted close to villages and more developed areas in the Valley. Maintaining small woodlots, wooded streamside habitat, and hedgerows in agricultural fields is vital to the continued utilization of these areas by this suite of wildlife. These environments are critical for the majority of the residents to continue to observe wildlife where they live.

Management Recommendations for Wildlife Habitat

Large Contiguous Habitat Units: The Core Habitat Units described above are areas with large core size, substantial forest interior habitat and generally a wide-diversity of wildlife habitat elements. They provide important habitat for large, wide-ranging wildlife such as black bear as well as specific habitat features critical for a wide variety of other species.

- Forest fragmentation in these larger CHUs should be discouraged. Roads, housing and most other human activities should be restricted to the periphery of these units.
- Forest management activities that support a diversity of forest and early successional natural communities are an appropriate use of these areas.
- Connections between the various wildlife habitats/elements within the units should be maintained.
- To maintain deep forest habitat for many declining songbirds, heavy forest cutting which promotes the development of edge conditions should be limited in these areas.

High Elevation Bird Habitat: High elevation songbird habitat is found in CHUs 1, 13, and 19. Bicknell's thrush and other high-elevation birdlife may nest in the higher elevations (generally above 2700 ft) within these units.

- Any forest removing activities proposed for areas above 2700 ft should be assessed by a professional biologist to ensure the minimization of impact to Bicknell's thrush breeding habitat.

Bear Habitat: Black bear require extensive remote areas to meet their yearly habitat requirements. Large, non-road areas must be preserved to maintain sustainable populations within the Mad River Valley. Bears must continue to have access to mast stands and forested wetlands. Bear habitat management can also focus on beech stands that have documented bear use (see Wildlife Habitat Elements Map included in the Appendix).

- Mapped beech stands and forested wetlands utilized by bear should be protected from development activities with buffers ¼ mile in extent. A professional biologist should address potential impacts to bear and their populations in these cases.
- Harvesting of beech that shows current or historic use by bear should be discouraged.

Ledge, Talus, and Cliff Habitats: Ledge, talus and cliff habitats are utilized by nesting birds, resting wildlife, and in some cases denning bobcats and porcupine.

- Human development activities should be discouraged on and near ledges, talus, and cliffs.
- A minimal 100' buffer should be maintained between these habitats and human development activities.

Deer Winter Habitat: These habitats are critical to the survival and maintenance of deer populations in the Mad River Valley. Without deer winter habitat preservation, deer populations within the Valley could decline.

- Deer winter habitats identified in this report should be protected from human activities by 300' buffers.
- A professional biologist should assess potential impacts from human development activities (except forest management activities) proposed within 300' of deer winter habitats.

Forested Riparian Communities: Forested riparian habitats offer important wildlife habitat and provide cover for wildlife movement.

- Wherever possible, forested riparian communities should not be fragmented by human activities.
- Forest management activities in forested riparian communities should utilize selective harvesting techniques only and maintain a continual forest cover.

Grassland Habitat: Grassland habitats were not a primary focus of this project, although a preliminary mapping of likely suitable habitat areas was completed. Further evaluation of the presence and use of this declining habitat type should be conducted within the two towns, and opportunities for conservation explored. Additionally, management of grassland areas should be encouraged in ways that is conducive to the reproductive success of the species that rely upon it whenever possible. Management strategies in should include delayed mowing (after July 15th) and bi-annual rather than annual mowing.

Travel Corridors: Functioning travel corridors allow for the movement of wildlife across the landscape. Conservation of wildlife travel corridors is often a difficult undertaking in that much of the negative impact to these features happens slowly over time. The affect on a particular corridor from one residential development, for example, may be small. Over the years, however, as more small development occurs, the once functioning travel corridor may receive less use and eventually disappear. Concrete management recommendations for the travel corridor presented here are, therefore, difficult to develop. The following steps, however, will increase the knowledge about the specific corridors in the towns and enable planners to draw more specific conservation guidelines.

- Conduct field verification studies to identify and characterize the important travel corridors within the Mad River Valley and especially those presented in this study.
- Prioritize the importance of these travel corridors for conservation action.
- Take steps to conserve the most important travel corridors by creating isolation buffers around them to maintain wildlife movement patterns.
- Limit development to the outside edge of corridors and encourage screening, natural color schemes and other actions to limit negative effects of development in or near corridors.
- Important black bear corridors are especially vulnerable and may require buffers of up to ¼ mile in extent.
- Improve vegetated buffer conditions along the Mad River and its tributaries to provide protected movement opportunities for wildlife.

7.0 Conclusions

The Mad River Valley provides habitat for a wide-variety of wildlife, including bear, moose, deer, fox, coyote, fisher, bobcat, mice, voles, and moles, abundant birdlife, a variety of amphibians and reptiles. It is home to a wide variety of upland and wetland natural communities. Waitsfield and Fayston have undertaken this investigation to better understand the nature and specifics of their natural resources and to plan for protecting these resources for their own sake and to enhance the quality of life for it's residents.

The quality of life in Waitsfield and Fayston is uniquely tied to the condition of the natural features in the towns. It is the clean water to fish and swim in, the woods to walk and hunt in, and the clean air to breathe that makes this area an attractive place to live and work. We are hopeful that the towns in the Valley will use the information within this report to carve out a home for wildlife, woods and wetlands as well as its citizens.

What we have presented in this report is essentially a snapshot of a dynamic landscape, the Mad River Valley, where habitats and people will push up against each other for some time to come. Hopefully the information contained here will inform the citizenry, developers, and town planners in the Mad River Valley and provide a basis for informed decisions that will promote conservation and human activities side by side. The natural resource inventory process is an ongoing endeavor constantly in need of fresh information. It is our hope that over the years, towns in the Valley will continue to map and assess their natural features and add to this snapshot in time.

8. References

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All photos and figures by Arrowwood Environmental.

