

2. BIOPHYSICAL REGIONS AND A LANDSCAPE PERSPECTIVE FOR CONSERVATION AND MANAGEMENT

As a Vermont landowner, you will need to carefully consider the effects of your actions and plan for effective habitat management and conservation on at least three scales.

Vermont is rich with wildlife, largely because we have an abundance and diversity of habitat that supports the needs of many species. These habitats include extensive areas of interconnected forests of many types, swamps and lakeside marshes, fens and bogs, cliffs and caves, seeps and vernal pools, fields and grasslands, and streams, rivers, and ponds. An important conservation goal is to maintain this diverse array of habitats to continue to support Vermont's wildlife resources and all the values they provide.

Achieving this goal over the long term will be challenging, given the continued loss and degradation of habitat associated with development. As a Vermont landowner, you will need to carefully consider the effects of your actions and plan for effective habitat management and conservation on at least three scales. First, you need to consider the needs of individual species where they occur, especially those species that are particularly sensitive to changes in their surroundings. For example, American woodcock require shrub wetlands for feeding, adjacent to old fields for courtship.

Second, you need to consider the distribution and condition of all habitats and natural communities in your local area and across the state. This is the best insurance that you will provide the habitat requirements for a broad range of species.

And third, you need to consider large, landscape-scale features, such as large areas of contiguous forest and the habitat that connects them. Although you may make decisions on how to manage your own lands based primarily on its conditions, you should also consider these larger landscape issues in order to put the value of the habitat on the property you are managing into context.

One way to understand the complexity of landscapes in Vermont is to examine the state's biophysical regions. Vermont comprises eight distinct regions based on differences in elevation, climate, geology, topography, hydrology, land-use history, and vegetation. Although wildlife distribution was not used specifically to develop these eight biophysical regions, there are some clear patterns of wildlife species distribution across the

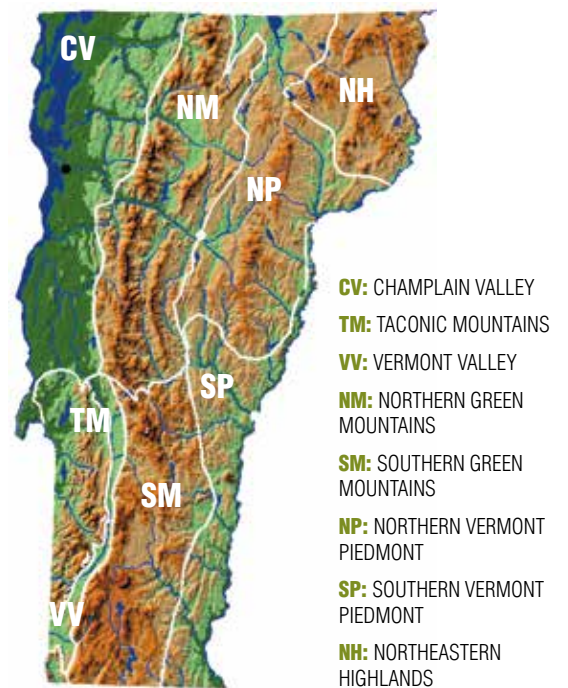


Figure 2.1 Biophysical Regions of Vermont

eight regions (e.g., montane forest birds within the high elevation habitats in the northern Green Mountains and northeastern highlands regions). Following is a brief description of each biophysical region in Vermont.

CHAMPLAIN VALLEY (CV)

Extending from the southern end of Lake Champlain and northward into Canada and along the St. Lawrence River valley, the Champlain Valley is one of the warmest regions in Vermont. It is also dry, with less than half the annual precipitation that falls in the Green Mountains. Lake Champlain and the low-elevation level plains with clay and silt soils near the lake dominate this region. Low hills rise up to the east to meet the Green Mountains where northern hardwood forests are common. On the warm rocky hills of the valley bottom, diverse forests of oak and hickory occur amid an agricultural setting. The rare Mesic Clayplain Forest once dominated the clay soils of the region but has now mostly been converted to agricultural land. Large wetland complexes of marsh, swamp, and floodplain associated with Lake Champlain and the deltas of the larger rivers provide regionally significant waterfowl and marsh bird habitat. Chittenden County is the most populated region of the state and the abundance of high-quality agricultural soils means that there are few large blocks of forest in this region.



TACONIC MOUNTAINS (TM)

This primarily forested region has complex geology, including the band of world-famous slate south of Lake Bomoseen, acidic hills of schist and phyllite, and rich limestone and marble slopes to the east. The climate is as variable as are the elevations, with Mt. Equinox rising to 3,882 feet and the Hubbardton River flowing through Benson at an elevation of 200 feet. Northern hardwood forests are common at mid-elevations and extensive rich northern hardwood forests occur on the eastern slopes. Spruce-fir forests grow on the highest elevations while oak-dominated forests grow on warm southern slopes and at lower elevations where hemlock and white pine are also common. Lakes and ponds are common to the northwestern part of the region (Bomoseen, St. Catherine, Hortonia, and Sunset), and river valleys provide productive agricultural land. The Taconic Mountains extend south into New York, Massachusetts, and Connecticut.



VERMONT VALLEY (VV)

This small, narrow region between the Taconic and Green Mountains is defined by its limestone and marble bedrock, the abundant wetlands along Otter Creek and Batten Kill River, and the low hills made up largely of well-drained, glacially derived soils. The underlying bedrock is rich in calcium, which has a strong influence on the wetlands of this region, resulting in many fens, seeps, and enriched swamps. Forests of oak, white pine, and hemlock are common on the coarse soils along the valley sides. The Vermont Valley has a long history of human use and now includes a major north-south road (Route 7) and train travel corridor. The valley wetlands provide important wildlife habitat, and maintaining adequate east-west wildlife corridors across the valley between the Green and Taconic Mountains will be an important challenge.





NORTHERN GREEN MOUNTAINS (NM)

The Green Mountains are part of the Appalachian Mountain chain that extends from Alabama north to Québec. The Northern Green Mountains include Vermont's highest mountain (Mount Mansfield at 4,393 feet), its coldest climate, and the greatest annual precipitation (72 inches). The bedrock is primarily acidic, composed of non-calcareous schists, phyllites, gneisses, and granofels. Northern hardwood forests blanket the region on the mountain slopes up to about 2,500 feet, above which yellow birch and red spruce are dominant. Spruce-fir forests occupy the higher slopes and summits, with alpine meadows above 3,500 feet. The extensive, unfragmented forests of this region provide habitat for many species of wildlife that thrive in remote, interior forest conditions. The high elevation forests of this region and the Southern Green Mountains provide habitat for several species of birds, including Bicknell's thrush, Swainson's thrush, and blackpoll warbler. The heavy precipitation and deep snows in the mountains feed some of the state's largest rivers, including the Missisquoi, Lamoille, Winooski, and White. Floodplain forests were once common along these rivers, but they are now mostly converted to agriculture.



SOUTHERN GREEN MOUNTAINS (SM)

This region has many similarities with the Northern Green Mountains. It has high mountains (Killington Peak is 4,235 feet), acid bedrock composed of the same material as the Northern Green Mountains, cold temperatures, heavy precipitation, and dominated by the same forest types that are largely determined by elevation. One distinct feature of the Southern Green Mountains is the relatively level plateau on the southern and western sides of the region. Here, northern hardwood forest and spruce-fir forest intermix with spruce swamps, poor fens, and small ponds. Beaver are abundant and have had a significant influence on the wetlands of the plateau. Another distinct and dramatic feature of the Southern Green Mountains is the escarpment along the western boundary. The cliffs and steep slopes of the escarpment drop more than 1,000 feet in some areas to the valleys to the west. The escarpment's acidic rock and warm western slopes support northern hardwoods, hemlock, and in many locations, oak and pine.



NORTHERN VERMONT PIEDMONT (NP)

Moderate in both its climate and topography, the Northern Vermont Piedmont is a hilly region bisected by many rivers. With rich soils derived from the underlying calcium-rich bedrock and gentle topography, this landscape is dominated by a dense network of roads connecting farms and small villages. Consequently, it contains fewer large forest blocks and has more fragmented wildlife habitat than in the Green Mountains and northeastern highlands.

The calcium-rich bedrock is responsible for the abundance of rich northern hardwood forests, northern white cedar swamps, and rich fens—all characteristic communities of this region. In contrast, the acidic granite hills of Derby, Glover, and Groton State Forest support northern hardwoods with abundant spruce and fir. The granite quarried in Barre is world famous for its high quality. The Northern Vermont Piedmont has many lakes and ponds, including the larger Memphremagog, Seymour, and Caspian, as well as numerous smaller ponds in the vicinity of Woodbury and Groton State Forest. These lakes and ponds provide successful nesting habitat for the greatest concentration of common loons in Vermont.

SOUTHERN VERMONT PIEDMONT (SP)

The Southern Vermont Piedmont is a variable region, with a cool climate in the northern hills, and some of the warmest temperatures in Vermont recorded in Vernon. The topography comprises gentle, rolling hills that rise from the Connecticut River Valley to meet the Green Mountains. Northern hardwood forest dominates throughout, but oak and pine forests occupy warm southern and western slopes in the hills of the central and southern portions of the region. Hemlock forests are also common. The Connecticut River and its tributaries provide important aquatic habitat. These river valleys also have abundant deposits of sand and gravel resulting from the last glacial period in Vermont. Although many of these well-drained soils have been developed or processed for gravel, temperate climate oak and pine forests are common on those that remain. Floodplain forests are also common along many of the region's rivers. The dense network of roads in this region has resulted in smaller blocks of forest and more fragmented wildlife habitat than in the less-developed regions. Turkey, gray squirrel, and white-tailed deer are some of the species that benefit from the abundance of acorns.

NORTHEASTERN HIGHLANDS (NH)

One of the coldest regions in Vermont, the Northeastern Highlands has a short growing season that has limited the conversion of the land for agriculture and created conditions that favor growth of coniferous forests of spruce and fir. Northern hardwood forests, as well as extensive spruce and fir forests, dominate the landscape of this region. The geology of this region is similar to that found in the White Mountains of New Hampshire and areas of northern Maine. The higher mountains are formed of acidic, weather-resistant granite, and some good examples of this include East and Gore Mountains. In sharp contrast, the distinctive Nulhegan and Victory Basins are formed from very soft granite that has eroded over long geological timeframes. These large basins collect cold air drainage and are dominated by spruce-fir forests, swamps, and bogs. This habitat is similar to areas found north of Vermont in Canada and supports several boreal forest species of wildlife including spruce grouse, gray jay, black-backed woodpecker, rusty blackbird, and mink frog. Moose are common in this region and the spruce-fir forests are critical overwintering habitat for white-tailed deer. Canada lynx and American marten have recently returned to portions of this remote region.



RESOURCES

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