

SECTION 4

Conservation Attributes in the Town of Atkinson

“We have the choice to use the gift of our lives to make the world a better place – or not bother.”

– Jane Goodall, world expert on chimpanzees



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4.1 – What is a Conservation Attribute?

A “conservation attribute” is a natural resource or other quality that is worth protecting.

Examples include:

- Buffers around wetlands to help maintain the quality of those wetlands,
- Wildlife habitat areas that provide shelter, food, water, and sufficient area to support wildlife of various types,
- Corridors of open space that allow wildlife to move about without crossing roads or encountering other human obstacles,
- Open areas that protect the quality of groundwater and promote rainwater infiltration,
- Forested areas that help to reduce the carbon in our atmosphere, and
- Opportunities for environmental education and passive recreation.

Many conservation attributes can be documented in the form of maps, and this is the primary focus on this section of the Land Conservation Plan.

However, there are some attributes that cannot be mapped, and these must also be considered when thinking about a land conservation project. These include:

- Scenic vistas and rural character,
- Historical importance,
- Vernal pools, which cannot easily be detected from the aerial photographs that most of our maps are based on, and
- Willingness of landowners to conserve their land for future generations of Atkinson residents.

This last attribute, the “willing landowner,” is perhaps the most important conservation attribute because landowners are essential to any conservation project. The Conservation Commission is not empowered to proactively “go after” a person’s land, nor do we want to. On the other hand, when a landowner indicates an interest in leaving a legacy in the form of open land, our role is to explore the options for conserving their land, as discussed in Section 3 of this Plan, and use the maps and other considerations presented here to determine the priority of spending our efforts and the Town’s money to conserve that land.

4.2 – An Introduction to the Maps

There are 14 maps presented in this section of the Plan. They are based on available Global Information System (GIS) data that is maintained in the University of New Hampshire GRANIT database, and the maps presented here were produced by Rob Pruyne at the Rockingham Planning Commission.

These maps give a good, high-level picture of what attributes exist in various parts of town, but should not be looked at in detail or used as a survey plan when considering a construction project. Data presented in the maps is sometimes incomplete or out of date, and should always be supplemented by current, on-the-ground investigation.

Nevertheless, the maps presented here do paint a reasonably good, high-level picture of what environmental qualities exist in Atkinson, and are a good starting point for considering future land conservation projects.

4.3 – A Description of the Maps

The maps described below may be found at the end of this section of the Plan.

Map 1 – Land Use 2015

The first map is a Land Use map from 2015 – this is one of the maps that was part of the 2015 update to the Town of Atkinson Master Plan, and this map is likely to be updated again this year. This map was created by digitizing a 2015 aerial photograph (which is shown as Map 10 below), and visually analyzing the uses of the land that can be seen in the photograph.

Looking at the legend for this map, you will see that the land use in Atkinson is broken down into many categories. From looking at the table contained in the map, you will note that in 2015 the largest land use was Forested Land with 2,936 acres, followed close behind by Residential use, with 2,633 acres. Open Wetlands with 381 acres, and Active Agriculture with 266 acres, were a distant 3rd and 4th largest land uses, respectively.

Looking back at the map, you can see the Forested land as light green, Residential land as light yellow, with Open Wetlands indicated by light blue markings, and Active Agricultural land as olive green, with other land uses indicated by other colors.

This map does not contain information that would be useful in setting priorities for future conservation efforts, but it does give a good snapshot of land uses as of 2015.

The table below is taken from the more general table that appears on Map 1, and summarizes major land use statistics from 1962 to 2015.

Land Use (acres)	1962	2005	2015
Forested	5,445	3,059	2,936
Residential	574	2,580	2,633
Industrial/Commercial	6	116	124
Active Agriculture	763	283	299

As shown by the data, residential development has increased by 2,059 acres or a 359 percent change while forested lands have decreased by 2,509 acres or a 46 percent change.

The conversion of natural landscapes to developed landscapes, including impervious surfaces and increased stormwater runoff pollution, can have significant impacts on the health and values of wildlife habitat, ecosystem services that humans rely upon, such as drinking waters sources, and the character of the community. This Plan aims to identify where strategic land conservation can help to mitigate impacts to natural resources and preserve Atkinson’s rural character.

Map 2 – Topography

The next map is a topographical map of the town, with 10-foot elevations shown as dark gray contours, and 2-foot elevations shown as light gray contours. This map was produced from elevation contour data derived from a 2011 Coastal New Hampshire LIDAR study (LIDAR is a technology that uses special aircraft-mounted lasers to measure elevations.)

The electronic version of this report allows the viewer to zoom in on all the maps, including this one, and see the 2-foot contours more clearly.

Also, as with all the maps in this report, this map is intended for visual use and comparison with other GIS maps only, and should not be relied upon for any other technical application such as subdivision planning. Nevertheless, it is an interesting map that was not previously familiar to the members of the Conservation Commission.

Map 3 – Soils (NRCS, 1994)

The third map contains high-level data about the underlying soil types found in Atkinson. Looking at the legend, you see that there are five broad categories of soils found in the town, each with its own qualities. These five soil types are:

- Canton-Hollis-Chatfield (NH012)
- Canton-Montauk-Paxton (NH014)
- Canton-Scituate-Montauk (NH036)
- Hinckley-Windsor-Canton (NH001)
- Paxton-Woodbridge-Hollis (NH033)

The data behind this map was derived from a broad-based inventory of underlying soils which was published by the US Department of Agriculture in 1994, and is not likely to have changed much in the last 30 years.

The reason for the variation in soil types along fairly pronounced lines can be attributed to the glacial deposits that were left here after the last ice age.

Map 4 – Agricultural Soils

The fourth map is a map of agricultural soils, which represents the soils near the surface of the ground as opposed to the underlying soils depicted in the previous map.

Looking at the legend for this map, we see that the underlying soil types from Map 3 are shown again on this map without shading, with agricultural soils data shown using solid colors.

There are three categories of agricultural soils shown on the map: soils of state-wide importance are shown in green, soils of local importance in purple, and other areas with good farming soils in blue.

The data behind this map suggest that all the shaded areas are good for farming, and certain areas are of local and State-wide importance.

Map 5 – Surface Water, Watersheds, FEMA Flood Hazard Areas

Map 5 contains three categories of data:

- Surface waters, including ponds, streams, and intermittent streams,
- Watersheds – indicating where precipitation in that area flows to, and
- FEMA flood hazard areas.

Looking at the legend for this map, we first see that flood hazard areas are represented by cross-hatched markings, watersheds are indicated by colored areas, streams are solid lines, and intermittent or seasonal streams are indicated by dashed lines.

Looking back at the map, we see the four watershed areas. Starting from the upper left, there are:

- the Arlington Mill Reservoir watershed in light green,
- the Lower Spicket River watershed in purple,
- the Lower Merrimack River watershed in light blue, and
- the Little River watershed in beige.

For FEMA flood hazard areas denoted by red cross hatching, you will note that Atkinson is fortunate to not have many such hazard areas, and those that we do have are in wetland areas where homes and other structures do not exist.

For the data behind this map, the flood hazard data came from the FEMA National Flood Insurance Program, and the watershed data came from the NH DES Water Resources Division.

Map 6 – Groundwater and Aquifers

Map 6 contains data about our groundwater resources.

Looking at the legend for this map, we see that it depicts the locations of public water supply wells and wellhead protection areas, shown as purple circles with little blue circles indicating the well locations. Stratified drift aquifers are shown as solid colors, and the map also shows the locations of potential sources of groundwater contamination, shown as orange circles with an X.

Looking back at the map, we see the town has quite a number of public water supply wells operated by the Hampstead Area Water Company and other community suppliers.

The Town has two areas of stratified drift aquifers on the east and west boundaries of the town. Unlike wells that are drilled into bedrock, these areas are particularly good sources of drinking water because they contain large sub-terranean deposits of sand and gravel from which water can accumulate and be easily extracted.

The public water supply data was obtained from NH DES, and was last updated in 2017, the stratified drift aquifer data came from the Complex Systems Research Center at UNH, and the

potential contamination site data came from NH DES, and was based on reports from well operators and other reports submitted to DES. This data was last updated in 2019.

Map 7 – Wetlands

Map 7 gives an overview of the wetland areas in Atkinson.

Looking at the legend, we see that wetlands, or “hydric soils,” are shown in green, and prime wetlands are outlined in orange.

Prime wetlands were delineated in a Prime Wetland Study conducted in 2002, and have been approved by the Town for special protections, both through our zoning, and through State regulations which are administered by NH DES.

Looking back at the map, you can see the general locations of wetlands and Prime Wetlands in Atkinson.

For this plan, we chose to define wetlands by soil type, namely “poorly drained” and “very poorly drained” soils, in order to be consistent with how our zoning defines them.

The soils data behind this map was based on field work conducted by the USDA Natural Resource Conservation Service, which was completed in 1985. It is generally believed that soil types do not change much over time.

Please note that this map is a good example of an earlier point, that while these maps give a general indication of our Conservation Attributes, they should never be considered as surveys of current conditions.

Map 8 – Open Space

This next map gives an overview of the Open Space in town, including town-owned conservation land, cluster development open space, and conservation easements of various sorts.

Looking at the legend for this map, you can see that there is a lot of information displayed here, for which the narrative here will not go into detail.

In general, town-owned conservation land is shown in green, and cluster development open space is shown in the “salmon” color. Easements are indicated by polka dots – green dots for

easements held by the Town, and red dots for easements held by others, such as the Southeast Land Trust. Municipal land, such as Town Hall, is shown in light purple, and undesignated town-owned land that is not under conservation protection is shown as gray on the map.

Since open space information the GRANIT database was found to be significantly out of date, the information shown in this map was completely researched and updated by members of the Conservation Commission, and represents both a search of the town's tax records and a search of the Rockingham County Registry of Deeds. The Conservation Commission maintains a local database of deeds and plans that substantiate the information shown on this map.

As of the writing of this Plan report, this data has not yet been updated in the GRANIT database.

Map 9 – Wildlife Habitat Features

Map 9 shows information about wildlife habitat in Atkinson, and contains data from two separate studies.

Looking at the legend, data from a 2014 study of the Merrimack River watershed area is shown by cross-hatching, olive green being more important than blue. This data includes both habitat considerations, along with water quality and recreational considerations, and thus is broader than just habitat.

The solid colors on the map are based on data from the more familiar Wildlife Action Plan, compiled by NH Fish and Game, and reflects data that was last updated in 2020.

Looking back at the map, you will see that there is some overlap between these two studies, which is to be expected, but that the Merrimack Valley study covers a broader area since it includes other considerations beside just habitat.

Map 10 – Aerial Photo (USGS / NH DOT 2015)

Map 10 shows a GIS-based aerial photograph of the town. It was produced by the US Geological Service (USGS) and NH Department of Transportation (NH DoT) in 2015. This is the photograph that was used to delineate the Land Use map (Map 1) and the Impervious Surfaces map (Map 11), among others.

As part of the Commission’s research into conservation areas in town, a more recent aerial photograph was produced, and is included in Appendix B, Map J of this plan. While not GIS-based, this photograph contains virtually the same accuracy as the GIS photograph, is more detailed, and contains tax map lines. This aerial photograph was made in September of 2020, is based on Google Earth, and has been corrected for angular distortions so that the tax map lines closely align with streets and structures.

Map 11 – Impervious Surfaces (UNH Complex systems, 2015)

Map 11 shows the impervious surfaces in Atkinson as of 2015 – things such as roads, driveways, parking lots, and roofs.

Looking at the map, the light gray areas are impervious surfaces such as driveways, parking lots, or roofs, and the black lines are roads.

Impervious surfaces are significant because they block rainwater from replenishing our groundwater resources. For this reason, the town’s Subdivision Regulations, that are administered by the Planning Board, take special care to require stormwater retention areas for run-off from impervious surfaces to allow rainwater to replenish our drinking water supply, instead of flowing down stream into the ocean.

Map 12 – Unfragmented Blocks

Map 12 shows unfragmented blocks of land in Atkinson, and is a map that was not previously familiar to the Commission.

Unfragmented blocks are areas that are mostly wooded, and have no street crossings that would impede the migration of wildlife. Atkinson is fortunate to have significant unfragmented blocks because of the many cul-de-sacks in town, which are a byproduct of our zoning.

As you can see, these unobstructed blocks cross town boundaries, since critters do not care about boundaries or property lines. The different colors in this map represent the various sizes of these blocks.

Such unobstructed swaths of land are an important natural resource, and are one of our priorities when considering future conservation projects.

Map 13 – Forest Resource Potential

Map 13 looks at the land’s ability to produce timber and other forest products, and it is based on an analysis of soils data.

Looking at the legend for this map, there are three broad categories of soils data presented here.

The bright green areas contain soils that are well suited for hardwood production, such as oak and maple.

The light olive-green areas are more sandy than the first category, and, although not ideal, can also sustain hardwood production.

The dark olive-green areas contain soils that are less fertile and dryer than the first two areas, and are well suited for softwoods, especially white pine.

As a side note, the Conservation Commission’s periodic timber harvests are not driven by the revenue potential from timber sales. While our selective timber harvests are done to improve the health and diversity of our forests, the revenue from timber sales helps to offset the cost of planning and carrying out a harvest, and any small excess in revenue is placed in the Forest Maintenance Fund, which we use to care for other aspects of our forests, such as invasive plant control.

Map 14 – Connecting the Coast (TNC, SELT, 2019)

And finally, we get to the last map in this section of the Land Conservation Plan.

In 2019, The Nature Conservancy and the Southeast Land Trust published a study of the coastal area of New Hampshire – including Atkinson – that, based on aerial photographs and other GIS data, predicts the likelihood of Wildlife Corridors and what they call “Prioritized Blocks,” which are areas where good wildlife habitat is likely to exist.

Looking at the legend, we see that the wildlife corridors are shown as light blue, and the prioritized blocks as beige.

As with the other maps in this Plan, the information presented here needs to be verified by on-the-ground observations and other research. But it is a good indicator that conditions are right for wildlife habitat and migration.

4.4 – How to Use These Maps

Information contained in the 14 maps presented in this section will be used when evaluating and prioritizing future conservation projects. The following discussion gives examples of the resources to be considered, and of how the information from the maps can be used in the decision-making process.

Drinking Water Protection – both quality and quantity

- How important is the parcel to protecting sources of drinking water, both private wells and public sources?
- Is the parcel part of a NH DES drinking water protection zone around a public source of drinking water?
- Does the parcel provide an important groundwater recharging function?
- Does the parcel provide a natural upland buffer for a stream, pond, or wetland?
- Is the parcel above a high-yield aquifer?

Flood Control

- Is the parcel in a 100-year floodplain?
- Does the parcel provide flood storage, acting as a “sink” for flood waters, which would otherwise be diverted to other undesired areas (such as a neighborhood) if the parcel were to be developed?
- Is the parcel in an area where an increase in impervious surfaces could exacerbate a flooding issue?

Agricultural Land

- Is the parcel currently being used for farming?
- Are the soils in this parcel highly ranked farmland soils by the USDA Natural Resources Conservation Service?

Farms contribute to the community’s character and scenic views, contribute to the local economy, and are frequently an important source for locally grown agricultural products. It is in the best interest of the town’s character and soil stability to keep farms in active agricultural use.

Passive Recreation and Hunting

- Does the parcel have the potential to be used by the public for passive outdoor recreation such as hiking, snowshoeing, or bird watching?
- Is the parcel adjacent to conservation lands that are already used for passive outdoor recreation?
- Does the parcel lend itself to hunting – is it large enough and contain habitat that is conducive for hunting, and/or is it contiguous with parcels that are currently open to hunting?

Wildlife Habitat

- What value does the parcel have to preserving wildlife habitat on the area?
- Is the parcel adjacent to conserved land that has high habitat value?
- Does the parcel provide an important wildlife corridor between other habitat areas that would otherwise become fragmented by roads, structures, or other impervious surfaces if the parcel were to be developed?
- Does the parcel provide an upland buffer of undisturbed natural vegetative cover adjacent to a pond, stream, or wetland?
- Does the parcel abut or otherwise protect Prime Wetlands?
- Does the parcel contribute to species diversity in the area?
- Does the parcel either directly provide, or indirectly protect, habitat for one or more animal or plant species listed by the NH Natural Heritage Bureau as rare, threatened, or endangered
- Has the parcel been identified in the 2020 NH Fish and Game Wildlife Action Plan, the 2014 Land Conservation Plan for the Merrimack River Watershed of New Hampshire and Massachusetts, or the 2019 Connecting the Coast Plan?

Forest Management

- Does the parcel have the potential to be managed as a Town Forest? Such land could provide revenue for the Forest Maintenance Fund. At the same time, management as a Town Forest would help to insure the health of the forest, the age and species diversity of its trees, and the quality and diversity of its wildlife habitat.

Educational Opportunities

- Does the parcel have the potential to be used in environmental education programs, both through our schools and community youth programs such as Troop 9, and through

Continuing Education programs for adults through organizations such as the Kimball Library?

Scenic Vistas

- Does the parcel have any importance for maintaining a scenic vista?

Scenic vistas in Atkinson include views of forest, open spaces, and land development patterns established over hundreds of years of settlement. Valued vistas include the tree-lined canopy along the Robert Frost/Old Stagecoach Scenic Byway, commonly known as NH Route 121/Main Street.

