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Acworth Conservation Plan 2024

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1. Introduction

The Conservation Plan provides updated, in-depth information about the status and management of natural resources in Acworth. It relies on historical and current thinking about resource conservation at the town, state, and federal levels. This document will serve as the basis for annual updates.

The Conservation Plan covers many natural resource topics, including

- 1) the physical and biological natural resources of the town (e.g. forests, waters, wildlife habitat, and plant-life, including rare and threatened species),
- 2) current natural resource issues (e.g. Crescent Lake pollution; prime wetland designation, wildlife corridor establishment, invasive plant management, high value area identification), and
- 3) plans and initiatives to address these resource issues.

Taken together, these topics provide

- 1) an inventory of Acworth's natural resources and
- 2) a guide for how these resources can be managed in ways aligned with current thinking about the environment (e.g. climate change, biodiversity) and with Acworth's local culture (e.g. keep the town the way it is, respect for private property in relation to community-wide values).

The Conservation Plan originate from a mission mandated by the State of New Hampshire. Specifically, State Law RSA 36A charges conservation commissions to

- 1) research local land and water areas,
- 2) keep an index of ecological areas within the town, and
- 3) recommend to the selectmen a program for the protection or better utilization of all such areas.

Acworth voters established the Town's Conservation Commission in 1972. The town included a report of the Conservation Commission's work in the 1979 Master Plan. This and all subsequent reports reside in the Town Office. A summary of this history will help clarify the status of the Conservation Plan.

The Conservation Plan and the Town's Master Plan

The Acworth Planning Board wrote the Town's first Master Plan in 1978 and adopted it in 1979. The 1979 Master Plan established two conservation goals:

- 1) protect natural areas from improper development and
- 2) conserve and acquire selected forest and agricultural areas.

In 2008 and 2012, addendums and amendments were added. Specifically, the 2008 Plan extended the 1979 goals by focusing on water quality, forest and wetlands management, wildlife habitat improvement, and climate change. It said the purpose of conservation in Acworth is to

1. Protect, maintain and encourage scenic and natural areas.
2. Protect our shared ground and surface water resources.
3. Promote public and private efforts to protect local wildlife and habitat.
4. Promote land use practices that maintain contiguous open space.
5. Support soil stewardship.
6. Increase public awareness of energy and resource conservation.

In addition, the subject of climate change appeared for the first time with a description of average current climate conditions.

The 2019 Plan went a step further and aggregated the original Plan, its addendum and amendments, and an updated Vision Statement and Land Use section. This compilation led the Master Plan authors to

- 1) encourage preservation of resources by... protecting natural resources such as forests and water,
- 2) support Conservation Commission monitoring of Town lands, and
- 3) explore ground water and steep slope protective amendments to the Zoning Ordinance.” The Town adopted and published the 2019 Plan in a limited-edition hard copy with an electronic version. The electronic version appears on the Town website.

In 2023, the Commission ambitiously decided to revisit and consolidate all past goals and efforts through extensive new research. The result is a comprehensive up to date Conservation Plan. This includes priority topics identified by townspeople over the years such as clean water, endangered wildlife habitats, forest and land conservation and climate adaptation. A detailed look at the contents of the 2024 Plan will clarify the scope of work of the current Commission. Highlights from the Conservation Plan will be utilized for updates to the Master Plan and this process will be used for every Master Plan update.

Summary of the Current 2024 Plan

The 2024 Conservation Plan visually describes the towns’ natural resources through the use of maps and graphs. Links to references and additional resources appear throughout. Through visual description, the Plan hope to more fully involve the Town in discussions about natural resource use now and in the future.

The Commission developed the current Plan late in 2022 using examples from other towns, guidance from the New Hampshire Association of Conservation Commissions and Acworth’s Natural Resources Inventory. Throughout 2023 the Commission identified many of the contents of the Plan. Concurrently, the Commission planned a formal outreach process to engage the community late in 2024 to obtain community feedback. Subsequently, the Plan will undergo periodic revision and be finalized and published to accompany the 2025 Annual Town Report and Meeting. Overall, the Plan

1. Creates one source that describes conservation goals, priority topics and priority areas.
2. List all natural resources.
3. List all known supporting agencies.
4. Contain a description, relevant monitoring, supporting agencies and references for most important natural resources.
5. Address climate impacts and makes recommendations.
6. Does not address cultural, recreational, or historic resources (e.g., stone walls, mines, walking trails)
7. Present brief history of Conservation Commission and Conservation Plan

Four Topics of Special Concern

1. Water Quality

Water quality has declined over the past 30 years in our major surface water sources--Crescent Lake, Cold River and other watersheds. Concom will develop short- and long-term actions with help from numerous organizations and agencies, including a) the Department of Environmental Services (DES), b) Rivers Management and Protection Program, c) the DES Lakes Management and Protection Program, d) Lake Sunapee Protective Association, e) Crescent Lake Water Quality Group and f) Crescent Lake Association. The actions will i) address current impairments, ii) continue to protect against known hazards such as cyanobacteria and milfoil and iii) respond to climate change impacts. Specifically:

- Participate in a county-led effort to address water quality issues in Crescent Lake.
- Support Crescent Lake Association efforts to monitor water quality.
- Investigate 2009 DES reporting on impairments in Crane Brook that required mitigation actions.
- Review permits and address complaints and violations as required.
- Leverage Lake Sunapee's "Let's Be Clear" campaign to educate and engage Acworth citizens in actions to address the issues.

2. Forest and Wetlands

The Town's Forest management plans need review and revision. Specifically,

- The Gove Road Town Forest Management Plan has not been updated in the last 20 years.
- The South Acworth Forest (Hilliard Road) is mostly an old conifer forest without much new growth. This type of forest has limited wildlife and limited carbon sequestration value. The Commission is assessing the forest with the goal to improve biodiversity and improve forest resiliency and wildlife habitats through professionally advised harvest operations.
- Assess an opportunity to conserve 19 acres on Crescent Lake (2 lots) that have significant conservation value.
- Monitor the addition of conservation easements across 2300 acres of conserved land. Review permits and address complaints and violations. Confirm annual monitoring for another 800 acres of other conservation easements.
- Provide educational opportunities for the importance of healthy forests and the positive impacts to global warming.
- Review permits and address other complaints, violations as required.

None of Acworth's many wetlands, including Keyes Hollow, likely the Town's most extensive and important wetland, has undergone formal wetland assessment. The Commission is rigorously documenting these wetlands through "co-occurrence" analysis to determine whether formal wetland assessment is warranted.

3. Wildlife Habitat Management

Private ownership characterizes most land in Acworth. Unfortunately, each year more land is removed from current use and made available for additional activities such as development. Loss of valuable wildlife habitat frequently results. Possible actions include:

- Continue the wildlife corridor initiative that was initiated by the 2004 Conservation Commission. Extend the location analysis utilizing current co-occurrences assessment. Determine opportunities to work with landowners to conserve parcels within the corridor. Provide educational opportunities to landowners.

- Provide education about the identification and management of for endangered, threatened, and invasive species.

4. Climate Impacts

Despite ongoing debate about climate change, Acworth's climate has modified over the last several decades. This change affects the Town's natural resources and their possible uses. In response, the Commission intends to

- Obtain regional and local assessments of predicated climate change impacts.
- Assess impacts to determine what possible actions might be taken and assess the efforts and their potential for success.
- Take actions that are consistent with other conservation goals, e.g., maintaining healthy multi-generational, diverse forests; increase carbon sequestration by 30%; place lands in conservation with easements that require proper forest management practices.

Focus Areas

- Improve Water_Quality in major waterbodies (lakes, ponds > 10 acres, 3rd and 4th order rivers and streams)
- Improve Forest and Wildlife Habitats of our town owned properties.
- Increase Wildlife Habitats – increase amount of conserved lands & begin creating wildlife corridors.
- Protect Wetlands – Assess the state of our major wetlands (> 10 acres) and determine best management practices (BMP); add identified BMPs to Conservation Plan (CP).
- Address Climate Change – Assess town/county climate change ecological impacts and determine applicable adaptative measures and add to our CP.
- Engage the Community via education, training and volunteer events. This could be a separate effort or part of any of the identified topics above.

The commission members ranked the Focus Areas:

- Engage the Community
- Wetlands
- Climate Change
- Water Quality
- Forest and Wildlife Habitats

A note on Methodology.

The Commission employed powerful natural resource management tools and concepts to make its analysis. The primary tools are natural resource maps generated by state and federal agencies. The maps include bedrock, hydrology, soils, wildlife densities, rare plant locations, and myriad combinations of these, such as state identified prime resource areas. All appear in an on-line mapping tool called GRANITView.

By manipulating the maps as overlays, one can see, for example, where forest types align with certain soils and topography or where wildlife densities co-occur with lands in conservation easement programs. By selecting several of these and other natural resource indices, one can see points of convergence or co-occurrences that pinpoint areas and features that are a) especially valuable, such as

contiguous sections of upland forest that provide exemplary wildlife habitat or b) especially vulnerable, such as wetlands with nearby unexpected buildings in the watershed. The areas that are most desirable or vulnerable receive a high-value area (HVA) label.

The examination of these High Value Areas (HVA's) represents a significant portion of the Conservation Plan, and these examinations appear in detail below.

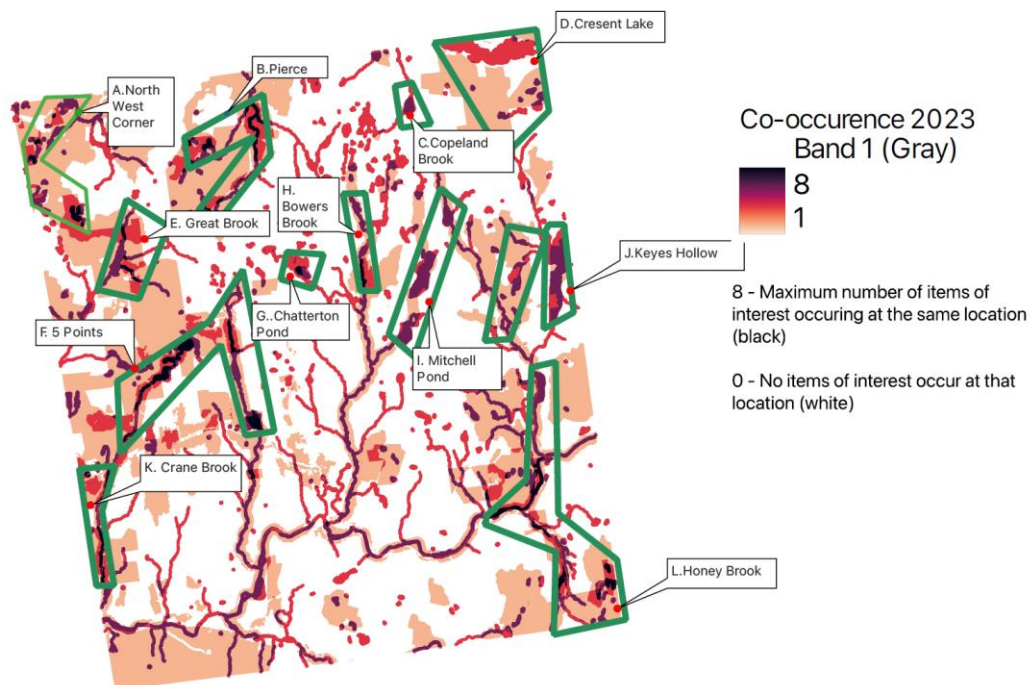
This extended and technical analysis led to the following:

- The Conservation Commission will focus its efforts on the HVA's.
- For each HVA, the Commission will develop a prioritized list of goals for land management (wetland & forest), water quality, wildlife, and climate change.
- Each year the commission will review each HVA's to monitor and update progress toward its goals.
- The appendix that shows development of the co-occurrence criteria and our HVA's.

Please note that this degree of natural resource analysis is very rare at the Town level in New Hampshire.

High Value Areas & Co-occurrences

As noted, High Value Areas will receive primary attention. The HVA analysis (see appendix) identified twelve HVAs. These areas represent locations where multiple conservation concerns and opportunities exist. They appear in dark purple on the map in Figure 1. Of the twelve areas, five warrant the most attention: 1) Crescent Lake Area, 2) Keyes Hollow Area, 3) Honey Brook Area, 4) Bowers Brook Area (includes Mitchell Pond), and 5) Five Points Area (includes Crane Brook). Bulleted descriptions of each area and proposed management goals appear below.



Twelve (12) areas were identified as High Value Areas. 5 of the 12 were determined to be the Priority HVA's and be the focus of the Conservation Commissions planned efforts.

- Crescent Lake Area
 - Keyes Hollow Area
 - Honey Brook Area
 - Bowers Brook Area (includes Mitchell Pond)
 - Five Points Area (includes Crane Brook)
- High Value Area Descriptions
 1. Crescent Lake
 - Bounded by Unity on the north and Lempster on the east. 2/3rds of the lake is in Acworth. 1/3 of the lake is in Unity.
 - Cold River Watershed - Headwaters of Cold River
 - Contains Crescent Lake which is the headwaters for the south flowing Cold River
 - About 380 acres near the lake are conserved in the town owned Gove Forest which is managed by the Society for the Protection of NH Forests (SPNHF).
 - Contains the summit of Gove Mt with steep slopes and 2 patches of rocky ridge along with a talus slope habitat.
 - Two parcels (19 acres) on the north shore of Crescent Lake are town owned but not conserved. This area is also considered a state designated priority resource area due to the proximity to the designated protected Cold River. There are 2 patches of peatland, and 1 patch of northern swamp in this north shore.
 - Southwest corner is a small area of Statewide Significant Habitat
 - Crescent Lake is considered a temperate lake habitat, having both cold and warm water fish.
 - Land is mostly northern-hardwood-conifer forest with a large patch of hemlock-hardwood-pine forest by the lake.
 - Contains locally significant soils for farming in the lowlands near the lake.
 2. Keyes Hollow
 - East Central section of Acworth bounded by Keyes Hollow Rd and the Lempster line.
 - Cold River Watershed - Headwaters of the Cold River
 - Contains Cold River and the large Keyes Hollow Wetland Area
 - Contains Underwood Brook and 2 tributaries to Cold River
 - Approximately 1/2 the land is marsh and shrub wetlands.
 - About 1/5 of the land is conserved - most of the eastern area
 - Majority of the Western area is Statewide Significant Habitat
 - Smaller sections of the Western area are Local Significance Habitat
 - Contains large number of hemlock-hardwood-pine forests.
 - Contains patches of farmland of local significance

3. Honey Brook

- Southeast Corner of Acworth, Runs along River Rd south of Heino then along 123A South to the Marlow Line
- Vilas Pool - Cold River Watershed and Headwaters of the Cold River Watershed
- About 1/3 of the land is conserved - contains Honey Brook State Forest
- Contains Cold River in north, Honey Brook along west and many small wetlands along east, confluence of Dodge Brook and Cold River
- Northeast and Southeast quarters are Local Significant Habitat
- Habitat of Statewide Significance along the rivers
- Vast majority of land is hemlock-hardwood-pine forest with a patch of northern-hardwood-pine forest.
- Contains patches of marsh and shrub wetlands and temperate swamp
- Contains farmland of state and local significance

4. Bowers Brook

- Central section of Acworth generally the area between Cold Pond Rd and Beech Rd, south of Heino Rd and south to Lynn Hill Rd then east by Ferrell Rd and north to Mitchell Pond
- Cold River Watershed - Headwaters of the Cold River; runs to the Cold River in the center of South Acworth
- Contains Bowers Brook as well as Mitchell Pond, Mitchell Brook and the large swampy area between Mitchell Pond and Lynn Hill Rd
- Nearly all the land is Statewide Significant Habitat
- A parcel of land just south of Cold Pond Rd is conserved.
- The land is mostly northern-hardwood-conifer forest and hemlock-hardwood-pine forest with a few small areas of grasslands and a few islands of peatland in Mitchell Pond
- The wetlands contain open water, northern swamps, wet meadow/wet scrublands.

5. Five Points

- West Central section of Acworth, generally between Derry Hill, Charlestown Rd, Sam Putnam Rd and Crane Brook Rd.
- Contains the Five Points Trail
- Contains Class 6 roads: Stebbins Rd, Pfohl Rd (SW end only), Old Stage Rd.
- Vilas Pool-Cold River Watershed; runs south into Cold River
- Contains headwaters of Crane Brook and Milliken Brook
- About 2/3 of the land is conserved - nearly all western section and small part of southern
- About 1/3 is Statewide Significant Habitat (along rivers)
- Very small sections are Local Significant Habitat
- There are patches of farmland of local and state-wide significance.
- Land Habitat is mostly hemlock-hardwood-pine forest with a central portion of northern-hardwood-conifer forest and grassland.

- In addition to Crane and Milliken Brooks, there are areas of marsh and shrub wetlands, northern swamp, peatland, and open water.

High Value Area Goals

<IN-PROGRESS>

- Crescent Lake
 - Conduct a Watershed Assessment & develop a Watershed Management Plan
 - Improve/protect Water Quality
 - Increase amount of conserved land
 - Improve or protect forests for wildlife habitat.
 - Develop and implement an Outreach Program
- Keyes Hollow <TBD>
- Honey Brook <TBD>
- Bowers Brook <TBD>
- Five Points <TBD>

2. Current Conservation Status

The Commission awarded each of the four topic areas (Water Quality, Forest and Wetlands, Wildlife Habitat Management, and Climate Change; see above, pg. 6) a status score. The status score results from the completion of the Acworth Conservation Scorecard. The complete scorecard can be found at: [Acworth Conservation Scorecard - DRAFT 12 Feb 24.pdf](#). In addition to the four topic areas (note that “Hydrology” substitutes for “Water Quality” in this section), there is an overall Conservation Status Score. All scores can be seen in the diagram immediately below.

- Acworth Conservation Scorecard – the complete scorecard can be found at:
 - [Acworth Conservation Scorecard - DRAFT 12 Feb 24.pdf](#)

Overall Conservation Status	YELLOW/RED	<ul style="list-style-type: none"> - Multiple impaired water features - Multiple conservation lands without current management plans - No established wildlife corridors or plans + Conserved lands are being monitored annually - Climate change impacts not defined; no adaptive actions in-progress or complete
Hydrology	YELLOW	<ul style="list-style-type: none"> - Most water bodies are impaired; warming trends; invasives and cyanobacteria increasing in county and state; aging septic systems; no regulation regarding septic maintenance
Forest & Land Management	YELLOW	<ul style="list-style-type: none"> + 2400 acres monitored - Only 376 of the 2400 has a plan in place; no actions have been performed since 2009 - No formal plan to increase amount of conserved land
Wildlife Management	RED	<ul style="list-style-type: none"> - Highlevel corridor plan only from 2009; no actions defined or in-progress
Climate Change Preparedness	RED	<ul style="list-style-type: none"> - Only obvious increases in flooding events identified - No adaptive actions identified; no actions in-progress or implemented

3. Natural Resources

One must know what resources are present to manage them effectively. Natural Resource inventories were completed in 2002 and 2004. In 2020 these resources were indexed using updated mapping techniques. A wide variety of biological and physical resources exist in Acworth. These are discussed below.

- Natural Resources Inventory
 1. A natural resources inventory phase 1 was completed in 2001, and phase 2 completed in 2004. The inventory creates an inventory of all our towns natural resources but is very verbose and does not provide a succinct list or index.
 2. Reference: [Natural Resources Inventory](#)
- Natural Resources Index
 1. In 2022 the Concom created a complete list or index of our natural resources – [Natural Resources Index](#)
- Description of Natural Resources (follows)
- Wildlife Habitats
 - a. A habitat is an area defined by the physical characteristics of the land and water as well as the plants and animals that live there. Each habitat has its own set of qualities to appreciate and threats that endanger it. The Wildlife Habitat Land Cover map from GRANITView below shows how habitats are distributed across Acworth. Note that the habitats are classified a bit differently between the New Hampshire Fish and Game, University of New Hampshire Extension, and the GRANITView Wildlife Habitat Land Cover. Notably missing from the GRANITView Wildlife Habitat Land Cover are dry shrub lands and vernal pools. These habitats are often small in area which may make them

difficult to map. We will use the GRANITView Wildlife Habitat Land Cover classification for our discussion

Wildlife Habitat Land Cover - GRANITView Wildlife Action Plan 2020



- b. As can be seen in the GRANITView Wildlife Habitat Land Cover map above, the largest area of dry land habitats are Hemlock Hardwood Pine Forests and Northern Hardwood-Conifer Forests with a lesser number of Grasslands. Rocky Ridges, Cliffs and Talus Slopes, and Developed Landscapes also appear in small smatterings around town. Wetland habitats include significant areas of Marshes and Shrubs along with smatterings of Northern Swamps, Peatlands, and Flood Plain Forests. Open water habitats include cold and warm water lakes, ponds, rivers and streams. Brief descriptions of the larger habitats adapted from the two linked sources that follow are given below. Further descriptions of habitats can be found at [NH Fish and Game Wildlife Habitat](#) and [UNH Cooperative Extension Habitat Stewardship Brochures](#).
- c. **Hemlock-hardwood-pine forests** are the most common habitat in NH. All of Honey Brook Forest east of 123A is an example of this habitat. These forests, typically found at elevations lower than 1400 ft, contain eastern hemlocks and white pines along with beech, sugar maple, white ash and red oak. In their prime these forests contain trees of all ages, downed logs, old trees with cavities, healthy mid-age trees and young growth. The understory of the hemlock-hardwood-pine forests contains black cherry, maple-

leafed viburnum, ironwood, and witch hazel. The forest floor has Canadian mayflower and starflower. These forests provide beech nuts, acorns and pinecones to feed a large variety of animals. They are home to large mammals such as black bear, moose and bobcats which require large swaths of uninterrupted habitat; birds such as American woodcock, barred owl, Cooper's hawk, wild turkey and ruffed grouse; reptiles such as the threatened spotted turtle; amphibians such as Jefferson/Blue-spotted Salamander; along with a huge number of more common fauna. Threats to the hemlock-hardwood-pine forests include fragmentation due to development, the hemlock woolly adelgid, effects from old logging practices which produce forests with trees all of one age, and climate change which may slowly replace the hemlock-hardwood-pine forest with the Appalachian oak-pine forest.

- d. **Northern hardwood-conifer forests** have a lot in common with the hemlock-hardwood-pine forest but are found at elevations between 1400 and 2500 ft. These are the forests of vibrant fall colors. Most of the north half of Acworth is made up of northern hardwood-conifer forests. The Gove Forest south of Gove Rd is an example of this habitat. The northern hardwood-conifer forests contain American beech, sugar maple, yellow birch, eastern hemlock, white pine and balsam fir with prime examples containing trees in all stages of life. The understory contains striped maple, hobblebush viburnum and witch hazel. The forest floor typically contains wild sarsaparilla, Canadian mayflower and blue bead lily. These forests contain moose and black bear, bobcat, gray foxes, as well a great variety of small mammals, birds, salamanders, and others. Threats to this habitat include development, uniform tree age, improper logging practices, wind farms, and climate change.
- e. **Grasslands** are areas where the main vegetation is grass, sedges or wildflowers with few or no trees and shrubs. They include pastures, hayfields, land for crops, and wet meadows. Most of Acworth is dotted with grasslands. An example would be the area at the intersection of Charlestown Road and Luther Hill Road. Grasslands are home to threatened bumble bees, Monarch butterflies, kestrels, meadow larks, bobolinks, grouse, black racers, wood turtles and so many others. These areas provide nesting sites for many ground-nesting bird species and mowing can be timed to protect young birds. Grasslands will succeed to shrub land and then to forest without intervention which usually includes annual mowing.
- f. **Marsh and Shrub Wetlands** are areas of wetland with grass and shrubs. An example of this habitat is the Keyes Hollow Wetland between River Road and Allen Road. This habitat provides a filter for pollutants as well as a place to store water during a flood. They are also home to red-winged blackbirds, beavers, American woodcocks, threatened ringed bog haunter, blue-spotted salamanders and many other rare and common species. Threats to these areas include invasive species of Japanese knotweed and purple loosestrife, sedimentation from development, Pollution from run-off, changes to the water flow due to development, and fragmentation.
- g. **Open Water Habitats** are classified by their temperature and whether they contain cold or warm water species of fish. The Cold River despite its name has warm water but both

cold and warm water species of fish and is classified as temperate. The same is true for Crescent Lake. All other bodies of water are classified as warm water habitats. In addition to fish, open water provides a habitat for loons, bald eagles, blue herons, otters, turtles, dragonflies & damsel flies, frogs, newts, mussels and so many others. Threats to these areas include pollutants from runoff and damaged by inappropriate stream crossings or dams.

- Geology and Soils
- During the Ordovician Period, 430 - 500 million years ago, New Hampshire is thought to have been under the sea, bounded to the west by an ancient continental predecessor of North America, and bounded on the east by a volcanic island arc. Some of that period's volcanism occurred under the sea and is now evident in the Ammonoosuc Volcanics. These rocks are located in exposures between Alstead and South Acworth at Osgood Ledge, west of the Cold River and are shown on the map in the NW and SW portions of Acworth (see Figure X). The Ammonoosuc Volcanics are a group of highly metamorphosed volcanic and volcanoclastic rocks, with some metasedimentary units as well. The group is largely made up of massive or layered beds of greenstone, amphibolite, schist, gneiss, and phyllite.
- Following this period of volcanic activity, sediments eroding from the land to the east and buried the igneous rock under beds of mud. The rock from this period metamorphosed into schist known as the Partridge Formation. This formation includes Metavolcanic rock chiefly consisting of amphibolite's.
- Toward the end of the Ordovician Period, the Taconic Orogeny occurred. With much folding and faulting, this mountain building event lifted the region of New Hampshire from under the sea. In the area of the Connecticut River, an upward arching structure formed as magma rose beneath the ground surface to form the Bronson Hill anticlinorium. Following this period of upheaval, erosion removed much of the Partridge Formation. What little remains of this formation is also located between Alstead and South Acworth.
- As the land subsided, the sea again covered western New Hampshire, depositing quartz sands and gravels in a relatively thin layer many feet thick. These sediments eventually became Clough quartzite, which present now in a narrow band between the older Partridge Formation and the younger Littleton Formation. A juncture where these three rock types are in close proximity to one another is at the mine on the side of Beryl Mountain. This formation includes Quartzite and quartz-cobble meta conglomerate which locally contains quartz-cobble conglomerate with abundant dark gray phyllite matrix that resembles the phyllite of the Littleton Formation.
- The Littleton Formation that formed nearly 400 million years ago during the Devonian Period is composed chiefly of fine to sandy muds, which have since metamorphosed into schists. Sporadic volcanism is also evident from this time and lies about one-half mile from the Cold River mouth, under many yards of sand and sediment. Rock representing the Littleton Formation is visible at Deep Hole in South Acworth and at Vilas Pool in Alstead. Within the Littleton Formation in western NH there are fossils dating back to the Devonian period. This formation is exposed on several of New Hampshire's most prominent mountains, including Mount Washington and the northern Presidential Range, Mount Moosilauke, and Mount Monadnock. This formation also includes metamorphosed limestone, calcareous sandstone, siltstone, and dark pelitic schist. Its lower contact is disconformable on the Clough Quartzite.
- About 385 million years ago the sea once again retreated and a period of folding began which coincided with the injection of masses of molten rock in the shape of great mushrooms into the

region of the Ammonoosuc Volcanics. These cooled and consolidated into the Olivarian magma series. One of these granite structures bisects the Cold River just west of Beryl Mountain and is called the Alstead Dome. At a later stage, magma was injected into the Littleton Formation. It cooled and formed Bethlehem gneiss, part of the New Hampshire magma series and visible in two areas along the river. First, the Bellows Falls Pluton reaches from Alstead south to the Connecticut River and is visible at Drewsville Gorge. Second, stretching upstream from Honey Brook to Crescent Lake is the Mt. Clough Pluton, exposed near Honey Brook where ledge bisects the Cold River.

- Since this last episode of folding and magma intrusions about 30 million years ago, erosion has been the dominant force in the Cold River Corridor, although it is likely that episodes of uplift alternated with periods of erosion many times in the last 25 million years.
- Along with the Ammonoosuc Volcanics at Osgood Ledge, the Clough quartzite, Partridge Formation and Littleton Formation juncture at Beryl Mountain, the Littleton Formation exposures at Deep Hole and Vilas Pool, the Alstead Dome just west of Beryl Mountain, the Bellows Falls Pluton at Drewsville Gorge, and the Mt. Clough Pluton at Honey Brook, are the amazing pegmatites in this area. Pegmatite is an extremely coarse-grained granitic rock formed during the same period as the New Hampshire magma series as a watery fluid injected into rock fractures. Because of their formation process, pegmatites are found in almost any rock type. Extremely large crystals form due to the watery nature of the material. Gene Boudette, NH State Geologist, conveyed that this mineralization resulted in a valley noted for its beryl and feldspar deposits. Beryl Mountain, just south of South Acworth, was the site of a large pegmatite mining operation. Beryl crystals four feet long and feldspar crystals fourteen feet long have been found in the Beryl Mountain mine. Other valuable minerals associated with pegmatites there include quartz, and books of white muscovite mica. Three other mines once operated in the South Acworth area that extracted primarily feldspar, which was shipped to the Midwest for use in the glass and ceramics industries. These features make the Cold River Corridor, including Acworth, a geologist's and rockhound's delight. (Bedrock Geology - COLD RIVER LOCAL ADVISORY COMMITTEE (weebly.com))
- There have been at least four major glacial advances and retreats during the Pleistocene era. However, for NH only the last glaciation, the Wisconsin, is apparent as this occurrence wiped out all evidence of previous glacial events.
- The Wisconsin ice age peaked from 18,000-20,000 years ago when all of New England was buried under what was up to a mile of ice in some places. The glacier gouged mountains as it advanced, stripping soil and removing earlier glacial deposits along its way southward. It scraped the northern sides of mountains and plucked the southern slopes and south facing cliffs. Thick rivers of ice ran through valleys, widened and deepening them as it advanced to the south. At its height, the Wisconsin ice sheet reached all the way down to Long Island, Block Island, Martha's Vineyard and Nantucket Island.
- Typically, as a glacier retreats, it leaves distinct features in its wake. However, here in NH, there are more land features of glacial advance than retreat. As we have seen, the geology formed the basis of the landforms for Acworth. The glacier then came along and modified the landform thousands of years ago, and then time, erosion and biology continued to modify the landscape of these Acworth hills.
- Drumlins are streamlined hills of till formed by glacial ice and are abundant in southern NH. Drumlins form a rolling landscape generally with a shallow depth to bedrock.

- Ground moraines are ridges of sediment, including sand, stones and even boulders, laid down where a glacier stalls so that a ridge of material gathers at the base of the glacier. Evidence of abundant moraines can be perceived through New England where stone walls are seen, created by early settlers to make way for farming.

- Forests, Wetland and Land Management

Forests, wetlands, and related natural areas must be managed within ecological, legal, and productivity contexts. For prudent and productive management, these areas must be delineated and described and then evaluated. The following discusses how the Conservation Commission undertakes these activities.

- Forests

- i) Description

- (1) Current Use Forestry - Acworth lists 24,131 total acres; of this 7,68.43 acres are enrolled in Current Use Forestry
- (2) Acworth has two Town Forests:
 - (a) Gove Forest contains 376 acres and was established by Town Meeting vote in 1997; Conservation Commission was charged with management under RSA 31:112,II; Proceeds gleaned to be deposited in a forest maintenance fund under RSA 31:113; Funds above implementation of the management plan dispersed by Town Meeting vote. SPNHF holds an easement.
 - (b) South Acworth Forest contains 81 acres and was established by Town Meeting vote in 2005 with the same provisions as Gove.
- (3) Income generated: Town records show \$93,978 received since 1997. (as of 2022)

- ii) Goals

- (1) Acworth Master Plan (original) 1979: "To conserve and acquire selected forest...areas."
- (2) Acworth Master Plan Addendum 2008: "Encourage increasing the Town Forest".
- (3) Update forest management plans
- (4) Conduct harvests to maintain or increase the biodiversity and resiliency.
- (5) Manage activities to be self-financing.

- iii) Recommendations

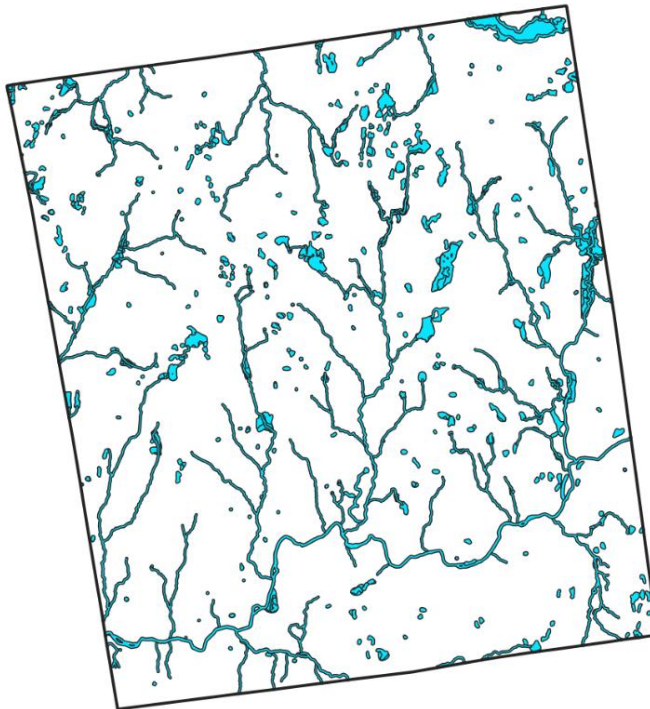
- (1) Evaluate conditions and forest health.
- (2) Hire a new Town Forester
- (3) Manage forests to updated forest management plans.

- Wetlands

- i) Description

- (1) Designated Wetlands - Acworth lists 24,131 total acres; of this 251 acres are designated wetlands.
- (2) Keyes Hollow - Acworth has one large wetland (Keyes Hollow) containing 39 acres which includes 3 parcels donated separately in 1974 and 1989 and was voted conservation status in 2003. The lots were later merged. SPNHF manage the easement, but the town owns the properties.
- (3) Prime Wetlands – This designation has not been assigned to any wetland areas in Acworth.

- (4) Priority Resource Area (PRA) – There are multiple areas in town that have the state designation of PRA. This affords those areas a higher level of protection against development.
- ii) Goals
 - (1) Acworth Master Plan (original) 1979: “To protect certain natural areas from improper development- floodplains, stream-belts, wetlands...”
 - (2) Acworth Master Plan Addendum 2008: “Protect our shared ground and surface water resources...”
 - (3) Promote public awareness.
- iii) Recommendations
 - (1) Evaluate conditions and wetlands health.
 - (2) Seek grant funding for wetlands health assessment.



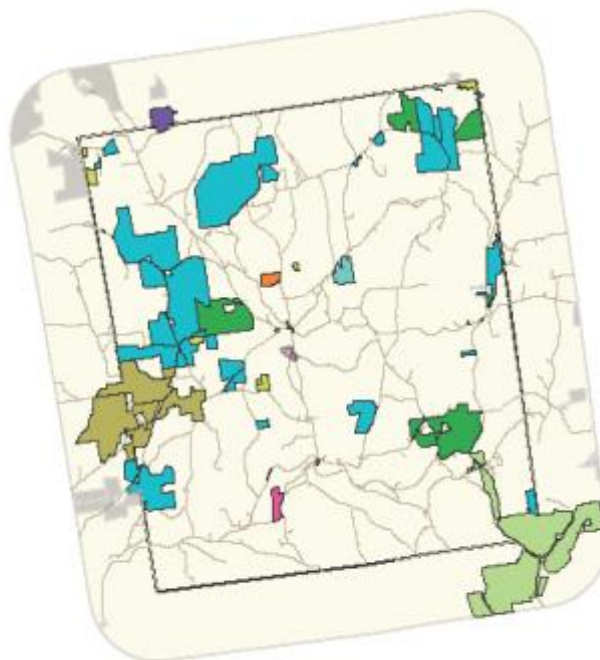
Map shows data from NH Fish & Game Map ,May 2021. All wetlands and surface water have a 50 ft buffer added surrounding them.

- Town Owned Lands
 - i) The town owns 32 properties as of 2022. ConCom is responsible for reviewing the list of properties every 5 years according to the towns policy.
 - ii) [Acworth Town Land Review Policy](#)
 - iii) 14 of the properties serve a civic or historic function such as recreation, highway, town office, library, town garage, transfer station, town fire water source and cemetery.
 - iv) 16 are either in conservation, a town forest or have significant conservation value.
 - v) 2 were recommended for sale to abutters in 2022.
 - vi) [Town Owned Properties](#) as of 2022


ACWORTH NH CONSERVATION PLAN

- State Owned Lands
 - i) There are 5 state owned properties in Acworth totaling about 186 acres of land. 2 small properties on 123A in the southeast, boat launch on Crescent Lake, and the majority is in Honey Brook State Park.
 - ii) The list of properties can be found in the above town owned properties worksheet.
- Conservation Easements & Monitoring
 - i) Description
 - (1) Conservation Commission Easement Monitoring 2023: The Commission monitors 2,341 acres of public and private conservation land annually.
 - (2) Conservation Commission 2022: Town forest and wetlands Conservation Easements (415 acres) are held by the Society for the Protection of NH Forests.
 - ii) Goals
 - (1) Acworth Master Plan Update 2019: “Support Conservation Commission monitoring of Town lands.”
 - iii) Recommendations:
 - (1) Conservation Commission 2022-2023: Through outreach and education, encourage the linking of conservation lands to create wildlife corridors.

Acworth Conserve & Public Land - May 2023



- Complaints and Violations

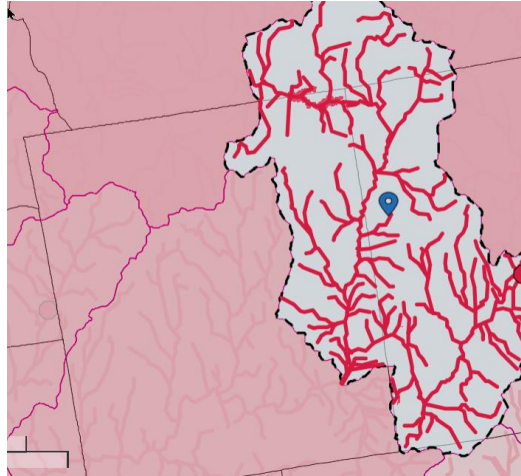
- i) Timber Harvest - If you require the assistance of a Forest Ranger for a law enforcement issue, you may fill out the Complaint Form and email it to jennifer.little@dncr.nh.gov or you can call (603) 271-2214.
 - (1) [NH Division of Forest and Lands](#)
 - (2) [Guide to New Hampshire Timber Harvesting Laws](#) - This guide gives a general overview of the Timber Harvesting Laws and is a good reference material for loggers, foresters, and landowners.
 - ii) Wetlands, Shoreland, Land Use Complaints
 - (1) [File a Land Resources Management complaint form](#). with the New Hampshire Department of Environmental Services' Land Resources Management (LRM)
 - (2) [LRM Compliance Regions Map](#) .
 - (3) Questions? Call [\(603\) 271-2147](tel:6032712147)
 - iii) Protected Shoreland - For other questions on proposed projects within the protected shoreland, please email shoreland@des.nh.gov or call (603) 271-2147 and ask to speak with the Inspector of the Day.
 - iv) All other DES Complaints - <https://www.des.nh.gov/complaints#faq32146>
- Hydrology

Hydrology refers to the above and below ground water resources of the Town. These include lakes, rivers, streams, springs and aquifers. In addition, the topographical boundaries of these water resources, their watersheds, must be considered. Watersheds define the area where rainfall and subsequent surface and subsurface water movement contributes to a given water body. The opportunities and risks for all these water resources command conservation attention. Below is an extensive look at water in Acworth and an examination of how it can be managed.

 - General Description, Goals and Risks
 1. Acworth contains water bodies in 4 watershed HUC 12 areas.
 - Little Sugar River – 010801060701
 - Cold River – 010801070203
 - Vlas Pool-Cold River – 010801070202
 - Headwaters Cold River – 01080107020
 2. Acworth has 46 surface water features or feature components within these watersheds. (*see Appendix Natural Resource Index for a complete list*)
 3. 31 major and 12 minor water features (3 are to be determined). Major water features include the 130-acre Crescent Lake and 10 miles of the 22 mile long Cold River. There also exist some unnamed water features; most of which are first order streams. The unnamed features have not been identified or assessed as of August 2023.

Note: Major water features include lakes, ponds > 10 acres and 3rd and 4th order rivers or streams. Minor water features are lakes and ponds < 10 areas and 1st and 2nd order streams.
 4. Goal: The goal of the ConCom is to ensure that the water quality and inflow reports from the monitoring agencies is reviewed and work with those agencies to develop town and individual actions plans to address any issues or concerns. Also, to address and direct any reported complaints or issues as presented.

5. Risk: Water quality in all our surface waters continues to be a concern throughout our town, state and at the national level. Flow monitoring on Cold River is generally in a good state.
- Monitoring
 1. Primary Monitoring Agencies
 - NH Department of Environmental Services
 - Environmental Protection Agency
 - Cold River Advisory Council (*no longer in operation*)
 - Crescent Lake Association
 2. Inflow Stream & Levels
 - The Cold River is one of New Hampshire's protected rivers and therefore is part of the [Instream Flow Program](#) conducted by NH DES
 - Monitoring stations are setup in the state's identified protected rivers and "protected instream flow study reports" are created to identify current instream flow and water quality and compare those measures against established standards.
 - A water management plan for the Cold River is being created that will outline what needs to be done to protect the water way. The Cold River Water Management Plan is due to be published for the first time in 2023 by NH DES.
 3. Water Quality
 - Water quality is also monitored by NH DES under two programs that are relevant for Acworth, [Rivers Management and Protection Program](#) and [Lakes Management and Protection Program](#).
 - Every two years DES produces a report describing the quality of NH surface waters. Some waters are categorized as impaired, and some impaired waters require the creation of a Total Maximum Daily Load (TMDL). A TMDL is the calculation of the maximum amount of a pollutant that a waterbody can sustain while also attaining or maintaining water quality standards for its designated use.
 - 27 water quality monitoring's occur within Acworth every 2 years by DES.
 - Surface water quality assessments are created for each body of water and can be viewed online. [DES Surface Water Quality Assessment](#)
 - See Acworth's Natural Resources Index for a list of all surface water features.
 - Watersheds & Their Waterbodies
 1. Watershed #1: Headwaters Cold River (010801070201) includes Crescent Lake



Location: Northeast corner of Acworth, also present in Unity, Lempster and Marlow. Extends from Crescent Lake area south into Marlow and east into Lempster.

Description: Contains 47 water bodies and 36 monitoring sites and is present in Unity, Lempster, Marlow and Acworth.

Current Condition: Impaired for aquatic life, shellfish, and fish consumption due to levels of acidity, bacteria and mercury

Key Surface Waters:

- Crescent Lake (Acworth & Unity)
- Cold River (Acworth-Lempster-Acworth; Crescent Lake to Alstead)
- Dodge Brook (Lempster – Acworth)
- Honey Brook (Marlow-Acworth)
- Hamlin Brook (Lempster)
- Unnamed Brook (northern inlet - Unity into Crescent Lake)
- Cold River (wester inlet to Crescent Lake)
- Underwood Brook (Acworth)
- Dodge Pond (Lempster)
- Lyme Timber Pond (Lempster)
- 7 unnamed brooks to Crescent Lake (Davis/Coffin Hill to Crescent Lake)
- 7 unnamed ponds in Unity, Acworth, Lempster

Monitoring and Monitoring Agencies: Crescent Lake Association (CLA), NHDES, Crescent Lake Water Quality Group (WQG)

References:

- [Cold River Watershed Management Plan](#) -
- [Environmental Protection Agency – “My Waterway”](#)
- [Crescent Lake Association \(CLA\)](#)

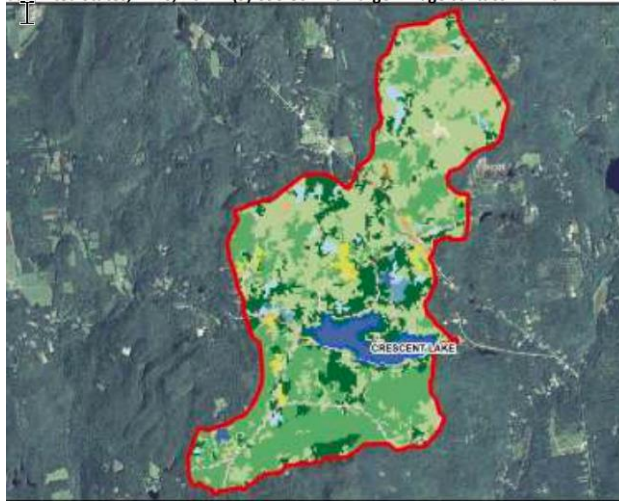
Recommendations

- A Crescent Lake Water Quality initiative began in 2023 with the goal to conduct a watershed assessment and create a watershed restoration plan

ACWORTH NH CONSERVATION PLAN

Crescent Lake

- **Description:** Crescent Lake (CL) is a 130-acre lake with an average depth of 10' and a maximum depth of 25'. It is home to small mouth and largemouth bass, black crappie, yellow perch. It has 2 primary inlets, one from the west and the other from the north into the northeast corner of the lake. 7 other unnamed intermittent and perennial streams feed the lake. Crescent Lake has its own watershed but is also part of the larger Cold River watershed (010801070201). There is a public boat launch which was deeded to the state in 1961. In a public hearing also in 1961 the launch was deemed to be a "public access to a waterway" and by statute the maintenance responsibility for a "public access to a waterway" falls to the Town of Acworth.



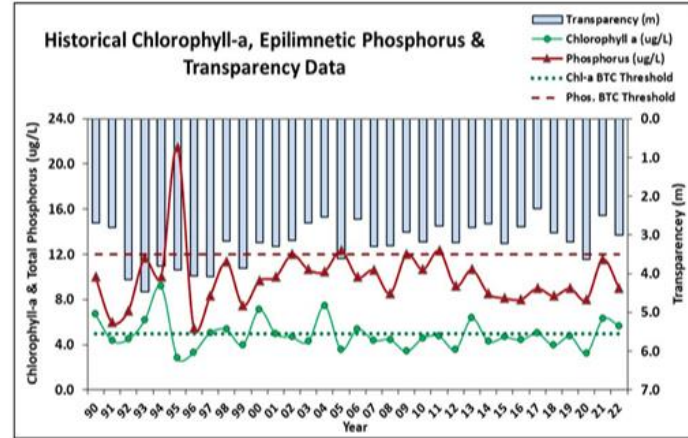
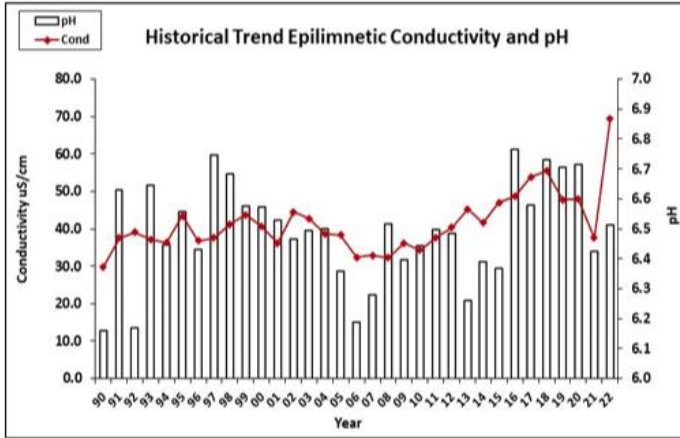
MORPHOMETRIC DATA				TROPIC CLASSIFICATION		KNOWN EXOTIC SPECIES		
Watershed Area (Ac.):	2,925	Max. Depth (m):	7.3	Flushing Rate (yr ⁻¹)	3.7	Year	Trophic class	
Surface Area (Ac.):	116	Mean Depth (m):	3.2	P Retention Coef:	0.53	1979	MESOTROPHIC	
Shore Length (m):	5,100	Volume (m ³):	1,526,500	Elevation (ft):	1215	1992	MESOTROPHIC	

The Waterbody Report Card tables are generated from the DRAFT 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm

- **Location:** Crescent Lake is located in the northeast corner of Acworth. The lake is in both Acworth and Unity
- **Current Condition:**

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Parameter	Trend
Conductivity	Worsening	Chlorophyll-a	Stable
pH (epilimnion)	Stable	Transparency	Worsening
		Phosphorus (epilimnion)	Stable



MORPHOMETRIC DATA

Watershed Area (Ac.):	2,925	Max. Depth (m):	7.3	Flushing Rate (yr ⁻¹):	3.7
Surface Area (Ac.):	116	Mean Depth (m):	3.2	P Retention Coef:	0.53
Shore Length (m):	5,100	Volume (m ³):	1,526,500	Elevation (ft):	1215

TROPHIC CLASSIFICATION

KNOWN EXOTIC SPECIES

Year	Trophic class	Known Exotic Species
1979	MESOTROPHIC	
1992	MESOTROPHIC	

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Dissolved oxygen satura	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

- Monitoring and Monitoring Agencies
 - NH Department of Environmental Services (DES)
 - Crescent Lake Association (CLA)
 - DES provides recommended actions and observations for chlorophyll-a, conductivity/chloride, color, total phosphorus, transparency, turbidity and pH.
 - Observations are made at 5 points in the lake.
 - The data provides a historical trend analysis since 1990 when monitoring began.
- References:
 - [Volunteer Lake Assessment Program 2022 Data](#)
 - [NH Fish & Game Bathymetry – Crescent Lake](#)
 - [Crescent Lake Association](#) (volunteer)
 - Crescent Lake Water Quality Group – website pending; e-mail CLwaterquality@gmail.com
- Recommendations
 - Committee being formed as of June 2023 with the intent to improve or protect the Crescent Lake watershed and lake water quality. This will involve defining actions for homeowners, landowners, the town and other local agencies. Plan is to leverage

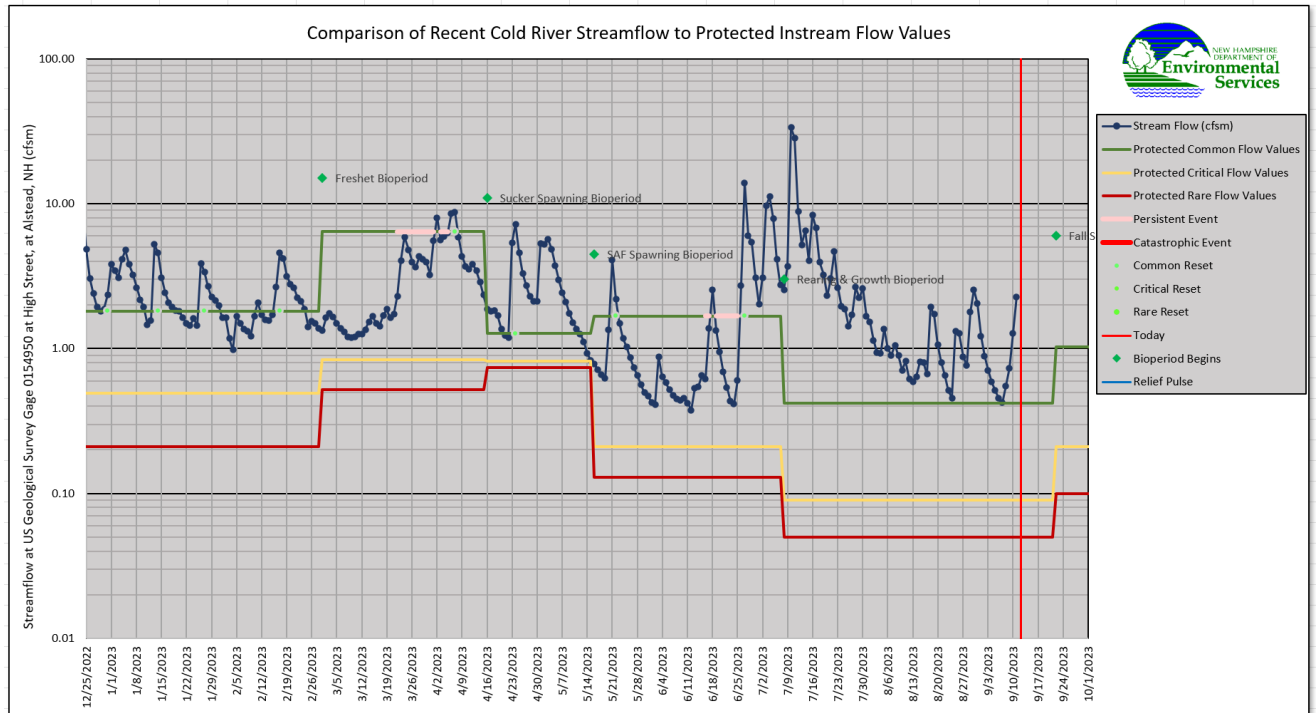
this assessment and the resulting restoration plan, if possible, for the other watersheds in Acworth.

Cold River

- **Description:**
 - The Cold River is 22 miles long with its headwater beginning at Crescent Lake in Acworth. It goes south through Lempster and East Acworth where it heads west through South Acworth to Alstead, through Langdon and Walpole where it ends in the Connecticut River. The surrounding terrain that slides each drop of rain, fog and snow toward the river is called the “Watershed,” a block of land covering approximately 102 square miles. Marlow and Charlestown have important places at the outer edges of the Watershed, bringing the number of Watershed towns to eight.
- **Location:**
 - The Cold River runs its 22-mile course from Crescent Lake in Unity and Acworth through the lands of Lempster, Alstead, Langdon and Walpole where it empties into the Connecticut River under the Route 12 Bridge.
- **Current Condition:** Water quality - Impaired for aquatic life, shellfish, and fish consumption due to levels of acidity, bacteria and mercury. Instream flow is currently at or above common flow levels and above critical and rare historic flow values.

<p>COLD RIVER - UNDERWOOD BROOK Assessment Unit ID: NHRIV801070201-08</p> <p>Waterbody Condition: ■ Impaired (Issues Identified)</p> <p>Existing Plans for Restoration: Yes</p> <p>303(d) Listed: Yes</p> <p>Year Reported: 2022</p> <p>Organization Name (ID): New Hampshire (11113300)</p> <p>What type of water is this? Stream/creek/river (12.429 Miles)</p>	<p>Assessment Information from 2022</p> <p>State or Tribal Nation specific designated uses:</p> <p>Information on Water Quality Standards Expand All ⊞</p> <table border="1"> <tr> <td>Aquatic Life Integrity</td> <td style="text-align: right;">Impaired ></td> </tr> <tr> <td>Fish Consumption</td> <td style="text-align: right;">Impaired ></td> </tr> <tr> <td>Potential Drinking Water Supply</td> <td style="text-align: right;">Good ></td> </tr> <tr> <td>Primary Contact Recreation</td> <td style="text-align: right;">Impaired ></td> </tr> </table>	Aquatic Life Integrity	Impaired >	Fish Consumption	Impaired >	Potential Drinking Water Supply	Good >	Primary Contact Recreation	Impaired >
Aquatic Life Integrity	Impaired >								
Fish Consumption	Impaired >								
Potential Drinking Water Supply	Good >								
Primary Contact Recreation	Impaired >								

Cold River (Underwood portion) Waterbody Report Excerpt 2022



Cold River 2023 Instream Flow Study Report

- **Monitoring and Monitoring Agencies**

- Cold River Local Advisory Council (CRLAC) – is no longer in operation. It was made up of volunteers representing diverse interests within each of the towns in the designated section of the river. These are the towns of Acworth, Alstead, Langdon, Lempster and Walpole. Each member of the committee was nominated by his or her town officials and is appointed to a three-year term by the Commissioner of the NHDES. Acworth Conservation Commission is looking into managing some of the key activities that the advisory council was responsible for. A number of the council’s responsibilities were assumed by NHDES when the river was designated a protected river, which was due in a large part to the advisory council.
- The 2022 NH DES assessment divides the river into 8 portions in Acworth all 8 state that the water is impaired for aquatic life integrity and fish consumption with one listed as impaired for swimming and boating.

- **References:**

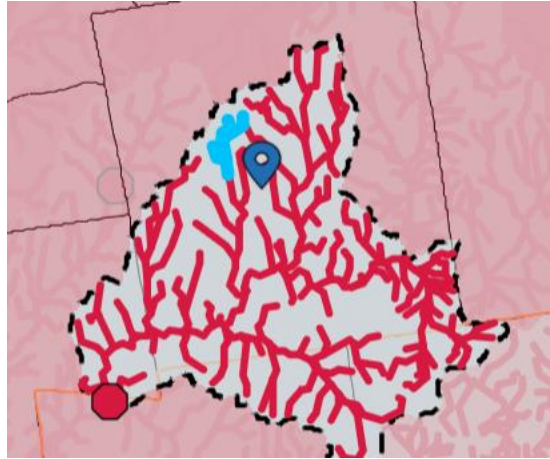
- [NHDES Rivers and Lakes](#)
- [NH DES Instream Flow 2023 Study](#)
- [NH DES Instream Flow](#)
- [EPA “How’s My Waterway”](#)
- [Cold River Local Advisory Council](#) – *no longer in operation*

- **Recommendations:**

- Continue to leverage NHDES monitoring for water quality and instream flow.

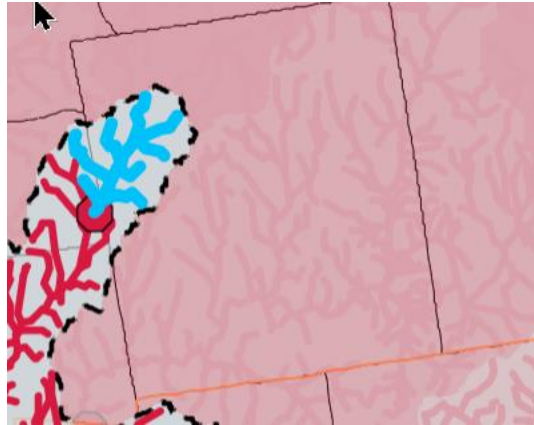
- Identify tributary risks and issues via watershed assessment and restoration plan

2. Watershed #2: Vilas Pool-Cold River (010801070202)



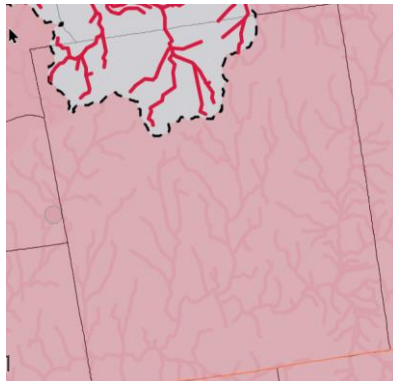
- Location: Central and South Acworth, also present in Marlow and Alstead.
- Description: Contains 39 water bodies and 29 monitoring sites.
- Current Condition: Impaired for aquatic life, shellfish and fish consumption due to levels of acidity, bacteria and mercury. Within Acworth Bowers Brook has been identified to also have impaired levels of E. coli impacting recreational use.
- Key Surface Waters:
 - Cold River (Acworth, Alstead)
 - Bowers Brook (Acworth)
 - Milliken Brook (Acworth)
 - Great Brook (Acworth and Alstead)
 - Dodge Brook (Lempster and Acworth)
 - Honey Brook (Marlow and Acworth)
 - Chatterton Pond (Acworth)
 - 17 unnamed brooks (Acworth, Alstead, Marlow)
 - 5 unnamed ponds
- Monitoring and Monitoring Agencies: NHDES
- References:
 - [Cold River Watershed Management Plan](#)
 - [NH DES Instream Flow 2023 Study](#)
 - [NH DES Instream Flow](#)
 - [EPA "How's My Waterway"](#)
 - [Cold River Local Advisory Council](#) – *no longer in operation*
- Recommendations
 - Conduct a watershed assessment and create a watershed restoration plan.
 - Identify impairment issues and sources within tributaries and ponds within Acworth.

3. Watershed #3: Cold River – 010801070203



- Location: North-western Acworth, also present in Charlestown and Langdon.
- Description: Largest of all the watersheds with 51 water bodies and 76 monitoring sites however most of water bodies are in Charlestown and Langdon. Only a small upper portion of the watershed is in Acworth.
- Current Condition: Impaired for fish consumption due to levels of mercury. Insufficient data exists for aquatic life, and recreational use.
- Key Surface Waters:
 - Upper Great Brook – Unnamed Brook
- Monitoring and Monitoring Agencies: NHDES, Cold River Local Advisory Council (CRLAC)
- References:
 - [Cold River Watershed Management Plan](#)
 - [EPA “How’s My Waterway”](#)
 - [Cold River Local Advisory Council](#) – *no longer in operation*
- Recommendations:
 - Due to the limited surface water and residences impacted by this watershed, there are no recommendations at this time.

4. Watershed #4: Little Sugar River – 010801060701



- Location: Northwest to northeast Acworth, also present in Charlestown and Unity.

- Description: Contains 28 water bodies and 8 monitoring sites.
- Current Condition: Impaired for shellfish and fish consumption due to levels of mercury. Unknown condition for aquatic life, swimming and boating.
- Key Surface Waters:
 - Sawyer Brook (Acworth, Charlestown)
 - Pierce Brook (Acworth, Unity)
 - Unnamed tributary into Pierce Brook
 - The rest of the surface waters are in Unity or Charlestown not in Acworth
- Monitoring and Monitoring Agencies: NHDES
- References:
 - [EPA “How’s My Waterway”](#)
- Recommendations:
 - Due to the limited surface water and residences impacted by this watershed, there are no recommendations at this time.

4. Climate Change

A changing climate presents many unknowns, but there are sufficiently clear trends to recommend proactive adaptive management. By looking at the predicted impacts, and reviewing current best practices, a plan can be developed and implemented. <IN-PROGRESS>

- Define predicted impacts using latest federal and state assessments
- Define recommendations based on high value areas and climate impacts; including costs and benefits
- Determine funding sources and feasibility

5. Education & Community Out-Reach

Good natural resource management requires knowledgeable and supportive Town residents and administration. Furthermore, they must know not only what’s beneficial but want and be able to take action. Education and Community Out-Reach comprises all the ideas and activities that the Conservation Commission believes will productively engage Acworth in its efforts to wisely protect and use its natural resources. <TBD - PENDING>

6. Appendix Items

- Co-Occurrences and High Value Area Process
- Goal and Objective Creation Process <IN-PROGRESS>
- Education and Outreach <IN-PROGRESS>
- Maps and references <IN-PROGRESS>
- Invasive species (plant, insect, animal, disease)
- Rare and endangered species
- [Acworth Conservation Commission Bylaws](#)
- Commission responsibilities and procedures <TBD - IN-PROGRESS>
 1. Easement Monitoring
 2. Permits
 3. Town Owned Lands Review
 4. Annual Green-Up Day
 5. Meeting minutes and agenda
 6. Conservation Plan Annual Management
- [Natural Resource Index](#)
- [Resources and Agencies](#)

Co-Occurrences and High Value Area Process

1. Process and Groupings

Step 1 - decide what data to include in the map.

Using the Conservation Commission's mission and the available data, we decided that the following 5 sets of data were most reflective of our mission.

1. Habitat of local significance
 - a. Data is from 2020 map made by NH Fish & Game
2. Habitat of statewide significance
 - a. Data is from 2020 map made by NH Fish & Game
3. Rare and Endangered Species
 - a. Data from NH Natural Heritage Bureau and an online map which I can no longer locate.
4. Conserved Lands
 - a. Data is from Acworth Town Hall (2022) and GranitVIEW map of conserved land.
5. Water and Wetlands Map
 - a. Data is a summation of the GranitVIEW surface water maps and the GranitVIEW National Wetlands Inventory II. A 100-foot buffer was added to all bodies of water in this map.

Step 2 - combine the data.

To create the co-occurrence map we had to find an algorithm to combine the data so that it would best reflect our mission.

We first tried a simple algorithm where 1 point was given for an occurrence on each map for a maximum of 5 points. This created a co-occurrence map that did not highlight our priorities, specifically surface waters were not emphasized the way we felt they needed to be. After several iterations we came up with the following:

- 1 point for each occurrence on the Habitat of Local Significance Map
- 2 points for each occurrence on the Habitat of State Significance Map
- 2 points for each occurrence on the Rare and Endangered Species Map
- 2 points for each occurrence on the Conserved Land Map
- 4 points for each occurrence on the water and Wetlands Map

This created a co-occurrence map which had points that could range between 0 and 11. The highest value of our data was 8 and the lowest value 0. The color band was assigned to the map with 8 being the darkest color and 0 being white.

Step 3 - Create high value areas.

Using the co-occurrence map, every location with a value of 8 was circled. Locations with values 7 and 6 were then added to the map and areas were combined, expanded or added to get 12 High Value Areas.

These High Value Areas are where the most valuable wildlife and water resources are in Acworth according to the Conservation Commissions interpretation of our mission.

Step 4 - Prioritize the High Value Areas

From the 12 identified High Value Areas, we selected 5 to be the focus of the Conservation Commissions work.

- Crescent Pond Area
- Keyes Hollow Area

Honey Brook Area
Bowers Brook Area (& possibly Mitchell Pond)
Five Points Area (& possibly Crane Brook)

These 5 were selected based on the need for protection and remediation as well as the possibility of effecting a positive outcome for conservation in the town based on the available workforce and money.

General Process

- Review our description and maps of the HVA
- Review current conservation actions
- Determine relevant priority topics** for the given HVA
 - Engage the Community
 - Protect Wetlands
 - Address Climate Change
 - Improve Water Quality
 - Improve and Increase Forest and Wildlife Habitats

Outreach

- Determine objectives and goals for each priority topic
- Identify partners, agencies, roles and stakeholders for each goal and objective
- Develop message(s) for each goal and objective
- Choose appropriate channel(s)
- Schedule channels/messages (implement)
- Evaluate results (TBD)