NATURAL & HISTORIC RESOURCES

2	Norwich's citizens value the town's natural resources and are concerned with their protection. This has
3	been shown by the responses to several town-wide surveys and questionnaires conducted by the Planning
4	and Conservation Commissions over the past decade. The Capital Land Fund, in existence for more than
5	two decades, is evidence of community support through annual dedications of public funds for
6	conservation and resource protection.
7	Norwich's natural resources are valued for contributing to its citizens' well-being and the town's rural
8	character. This chapter will explore the past and present state of Norwich's natural, scenic and historic
9	resources and suggest how those resources should be treated in the future.
10	A Changing Landscape
11	The colonists who first moved into the forested lands of the Norwich Town Grant did so with the
12	intention of making use of the area's natural resources. They settled along the river plain and above the
13	fall-lines of the brooks, where there was good soil. At first, they avoided the ancient bed of glacial Lake
14	Hitchcock, where they found soggy clays and wetlands, and where the streams were clogged with flood
15	debris.
16	As more immigrants arrived, they cleared and settled the land between the banks and deltas by the lake
17	created over several thousand years while the continental ice sheet was retreating. Early settlers quickly
18	deforested much of the arable land using a slash-and-burn technique to create farm fields and pastures.
19	This rapid change in the landscape had many impacts on the town's natural systems – loss of species as
20	habitat disappeared, alteration of soils, extensive erosion from deforested uplands that deposited silt and
21	modified streams, damming and diversion of streams for waterpower and irrigation. As the town
22	developed, residents began extracting the glacial deposits of sand and gravel for construction and road
23	building, a practice that continues today.
24	Once the broader expanses of level land were settled, homesteaders worked their way along <u>T</u>the main
25	brook valleys, which provided natural corridors where roads could be more easily built. The landscape of
26	the early 19th century was one characterized by significantly more open land than exists two centuries
27	later. Hillside farms, always marginal, were abandoned after several generations struggled to subsist on
28	their poor lands; the fields and pastures reverted to their natural forested state. Evidence of these
29	farmsteads can still be found - segments of stone walls, depressions created by old cellar holes, remnants

of stone foundations or chimneys - in what looks like undisturbed forest today. **Comment [RF1]:** Oops! Guess nobody noticed the people already living here...

The town's higher ridges and peaks remained largely undeveloped, although all but the least accessible
lands have been logged at some point during the last 250 years. Today most of the steep hills and ridges
are covered in forest, creating scenic vistas from both the valleys and the peaks. Norwich's topography
affords many opportunities for scenic views from the roads that travel along valleys and up into the hills.
These vistas are major contributors to the rural character enjoyed by Norwich's residents.
Over the last 50 years, Norwich's landscape has again undergone change. Residential development

expanded out from the river valley up into the hills. Modern technology and infrastructure have allowed
us to live in places previously too inaccessible or difficult to build on. While many of the homes located in
the town's uplands are barely visible as one travels the wooded back roads, each new house affects the
natural systems around it to some degree. The impact of those many small changes can have significant
cumulative effects – fragmenting wildlife habitat, altering surface drainage patterns, generating pollution.
While we generally recognize the importance of the town's natural systems and their functions today, we
continue to change the landscape around us and utilize its resources as suits our purposes.

14 Air and Climate Change

15	<u>Climate</u>
16	Climate represents the average weather conditions characteristic of an area over time. Weather patterns
17	are an important consideration for planning and design because of their effect on such things as soil
18	erosion, plant growth, storm water runoff and flooding, groundwater supplies, road maintenance, energy
19	demand and alternative energy supplies. Weather patterns, especially wind, also influence air quality.
20	<u>Norwich experiences average high temperatures in the low 80s during the summer and average lows in</u>
21	the single digits above zero during the winter. However, short periods of highs above 90°F and lows
22	below 0°F occur most years. Two to three inches of precipitation can be expected most months, as shown
23	in Figure 11-1.
24	The effects of climate change are already evident in Norwich, including more intense storms linked to
25	rising average temperatures. Over the next 50 years, climate change models have projected that the
26	average temperatures in the region will increase by five to nine degrees Fahrenheit. Such an increase
27	would reduce the number of months with average low temperatures below freezing from the current six,
28	to four, and increase the number of months with average highs above 80°F from two to three or four.
29	While some human residents may not miss the extra months of winter weather, the plants and animals
30	around us will. Climate change will alter the town's natural environment by changing the plant species
31	that can thrive in Norwich, the migrating patterns of waterfowl and songbirds, the temperature of rivers

Comment [RF2]: This section was moved up, and should be completely rewritten focusing the Change thing

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1	and ponds, and countless other changes throughout parts of the interconnected web of life. The climate
2	and natural environment will become more like that of the mid-Atlantic region. The impact on recreation
3	and tourism will also be significant, with fewer good days for alpine and cross-country skiing, outdoor ice
4	skating and snow shoeing resulting and a potentially longer mud season.
5	
6	Air Quality
7	Like most of Vermont, Norwich enjoys excellent air quality. Given the absence of large-scale industry or
, 8	major urban contors in the region, local air quality concerns are limited mainly to vehicle emissions.
0	especially from idling vehicles theating systems and dust generated by construction and execution sites
10	especially non-numg vehicles, heating systems, and dust generated by construction and excavation sites.
10	The cumulative effect of these local sources of all pollution would increase with additional growth,
11	absent deliberative mitigating policies, and may have a greater impact on air quality in the future.
12	Of more immediate concern are impacts on air quality resulting from pollution generated far from
13	Vermont. Most notably, the coal-burning power plants of the Midwest have been cited as the main cause
14	of acid rain and other airborne pollutants, which are detrimental to the health of forests and pond
15	ecosystems throughout the Northeast. Clean air is a basic resource that can no longer be taken for
16	granted even in rural communities like Norwich.
17	Climate
18	Climate represents the average weather conditions characteristic of an area over time. Weather patterns
19	are an important consideration for planning and design because of their effect on such things as soil
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29 30	would reduce the number of months with average low temperatures below freezing from the current six, to four, and increase the number of months with average highs above 80°F from two to three or four.

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Comment [RF3]: Use data, account for river valley

1	While some human residents may not miss the extra months of winter weather, the plants and animals
2	around us will. Climate change will alter the town's natural environment by changing the plant species
3	that can thrive in Norwich, the migrating patterns of waterfowl and songbirds, the temperature of rivers
4	and ponds, and countless other changes throughout parts of the interconnected web of life. The climate
5	and natural environment will become more like that of the mid-Atlantic region. The impact on recreation
6	and tourism will also be significant, with fewer good days for alpine and cross-country skiing, outdoor ice
7	skating and snow-shoeing resulting and a potentially longer mud season.

8 Terrain, Geology and Soils

9 Topography

10 Elevation

11	The elevation in Norwich ranges from 400 feet above mean sea level along the banks of the Connecticut
12	River to 1,850 feet atop Gile Mountain. The dramatic rise from the valley floor to the upland ridges and
13	hilltops creates the varied terrain that is an important component of the town's character. Norwich's
14	landform is often described as a hand, with the palm being the relatively level lands of the river valley and
15	the fingers being the narrow stream valleys that extend up into the hills. There are a number of named
16	mountains and hills as shown on Map 5.

17 <u>Slope</u>

- 18 Steep slopes characterize significant portions of Norwich, as shown on Map 6. Slope is one of the primary
- 19 characteristics of land that influences the uses it can support. While the map shows general areas of
- 20 moderately and severely steep slopes, site assessments may be needed to accurately delineate steep
- 21 slopes and determine the management requirements for specific properties.
- 22 Percent of slope is one way to describe the steepness of land and measure change in elevation over a
- 23 given distance. A one percent slope equals a one-foot change in elevation over a 100-foot distance. The
- 24 Natural Resources Conservation Service (NRCS) recommends careful management to limit site
- disturbance on slopes in excess of 15 percent and suggests avoiding all construction activities on slopes in
- 26 excess of 25 percent to prevent soil erosion, increased runoff, downstream flooding and other hazards.
- 27 On steep slopes, soils are typically shallower, the volume and velocity of surface water runoff is increased
- 28 and the erosion potential is greater than on level ground. Maintaining or restoring forest cover is the
- 29 optimal solution for controlling erosion and slowing runoff from steep slopes. The tree canopy helps to
- 30 dissipate the energy forces of a strong rainfall, while tree roots hold soil in place. Dropped leaves and

Comment [RF4]: LIDAR (down to 2ft intervals) and other data is standard expectation for development proposals

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forest litter help to prevent soil compaction, fertilize the soil, retain moisture, allow water to infiltrate the
 soil and recharge groundwater supplies.
 <u>Ridgelines</u>
 As described above, the town's topography includes a number of prominent hills and ridgelines, which

5 are characterized by their elevation and steep slopes. In addition to physical limitations and impacts on

6 natural resources, development on steep slopes and prominent ridgelines can adversely affect scenic

- 7 character. Development on hillsides, summits and ridgelines, especially at higher elevations, is often
- 8 highly visible from numerous vantage points. Such development also contrasts dramatically with the
- 9 natural backdrop of unbroken forest.

10 Bedrock Geology

11 The Connecticut Valley marks an important geologic boundary as well as the political boundary between Vermont and New Hampshire. The Ammonoosuc fault line lies just east of Interstate 91 along the river. 12 cuts along the interstate reveal the geologic history of the valley, which included periods of 13 sedimentary rock formation when all of New England was under the Atlantic Ocean and volcanic activity 14 15 metamorphosed older rocks The valley also contains a wealth of depositional and erosional features related to the more recent 16 17 glaciation during the last ice age. Most of what we now call the Connecticut Valley existed before that last 18 period of glaciation. Ice pushed into the valley from the north, gouging it deeper and wider. When the 19 glacier began to melt, the valley was flooded, forming an immense body of water referred to as Lake one time Lake Hitchcock and Lake Vermont (the glacial era Lak 20

21 separated by a few miles. Large amounts of sediment were released from the melting ice and were

22 deposited on the lake bed. As the floodwaters receded, the river cut a channel through the former lake

23 bed and its deposited sediments.

24 **Soils**

25 The physical and chemical components of soil vary greatly in Norwich and influence the suitability of land for various land uses, such as agriculture and development. The town's soils developed as geologic forces 26 27 shaped the landscape and underlying bedrock and topography, climate and ecological factors influences 28 their characteristics. The Natural Resource Conservation Service has inventoried, assessed and mapped 29 Norwich's soils; most recently updating its survey data in 1992. In 1994, the maps were converted into 30 digital format and are a layer of the Norwich Geographic Information System (GIS). While the maps vide an excellent basis for town level planning, site assessments may be needed to accurately. 31 32 dat rmine the types, characteristics and extents of soils on

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1 Shallow Soils

- 2 Soils on ridgelines and hillsides in Norwich are thin (less than two feet to bedrock). Shallow soils increase
- 3 the difficulty and expense of constructing adequate septic systems. In addition, soils overlaying steep
- 4 slopes are highly erodible and, like shallow soils, pose similar constraints to septic system installation and
- 5 proper operation.

6 Hydric Soils

- 7 There is only a small amount of land in Norwich characterized by hydric soils. These soils generally occur
- 8 in conjunction with streams and indicate that wetlands may be present, including unmapped Class III
- 9 wetlands.

10 Sand and Gravel Resources

- 11 Norwich has small deposits of sand and significant deposits of gravel. There are several active extraction
- 12 operations in town and a number of sites that have been previously mined for sand or gravel. The ability
- 13 to acquire sand and gravel locally significantly reduces the cost of road maintenance within the town.
- 14 With proper erosion control and reclamation techniques, their extraction can have minimal impact on the
- 15 environment and the land can be returned to other productive uses. Sand and gravel deposits are a
- 16 valuable, non-renewable resource for construction, which becomes unavailable for future use if built
- 17 upon. Further, the sand and gravel deposits near the Connecticut River, and elsewhere, are highly porous
- and readily transmit septic effluent to the groundwater, making them still less suitable for building.

19 Agricultural Soils

- 20 On a nationwide basis, certain soils are designated as prime for agriculture because of their chemical
- 21 properties and drainage characteristics. As shown on Map 9, Norwich has prime soils within the
- 22 floodplain of the Connecticut River and Ompompanoosuc River, and on the terraces of the ancient Lake
- 23 Hitchcock.
- 24 Many of the same characteristics that make these soils excellent for farming also make them a prime
- 25 location for development, as evidenced by the fact the Norwich village area is largely located on
- 26 agricultural soils. A large percentage of Norwich's agricultural soils are located on parcels of land less than
- 27 25 acres in size, which limits their productive use. Some of these soils remain undeveloped and, though
- 28 not sufficient for large-scale agricultural practices, have potential to be used for vegetable and specialty
- 29 crops for local and northeastern markets. The ability to grow food locally is one of the components of
- 30 Norwich's rural character valued by residents.

Comment [RF5]: Check permits get exact #

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1 Forestry Soils

- 2 The Natural Resource Conservation Service also has identified the best soils to support commercial
- 3 forestry, including many upland soils that are too shallow, rocky or steep to support other types of
- 4 development. As a result, primary forestry soils are generally less threatened by development, but are
- 5 more sensitive to site disturbance and erosion. To help prevent soil erosion, the state has adopted
- 6 acceptable management practices to prevent soil erosion and maintain water quality on logging jobs.

7 Septic Suitability

8 With no municipal wastewater infrastructure, all of Norwich's homes and businesses rely on soil-based

- 9 septic systems to treat their sewage. While the town can no longer regulate<u>s</u> wastewater systems, as that
- 10 authority was assumed in its entirety by the state in 2007, the capability of the town's soils to adequately 11 treat waste remains an important planning issue.
- 12 Norwich has large areas characterized by soils that are not well-suited for conventional septic systems.
- 13 The shallow depth of many of the town's soils noted above is a limiting factor, which often requires the
- 14 installation of more expensive alternatives such as mound systems, and is one of the factors driving the
- 15 high cost of new home construction in Norwich. It should not be assumed, however, that the current
- 16 assessment of the ability of Norwich's soils to adequately treat septic waste will on its own serve to limit
- 17 development in particular parts of town or control the town's growth rate over time. Wastewater
- 18 technology continues to evolve and soil conditions are likely to become a less critical factor in septic
- 19 system design in the decades ahead. New state standards adopted in 2002 reduced the required isolation
- 20 distances to bedrock and groundwater and allowed for alternatives to conventional systems.

21 Water Resources

22 Groundwater

- Groundwater is the least understood and documented of all our natural resources, yet it is essential to
 the preservation of life and to economic stability. The entire population of Norwich relies on groundwater
- 25 for domestic uses. It is tapped from underground springs or fractures in rock, or mined from underground
- 26 storage areas called aquifers.
- 27 Aquifers are subsurface deposits of coarse sand and gravel that, because of the depth of the material and
- 28 large pore sizes between sand grains and cobbles, hold vast quantities of groundwater. The coarse
- 29 texture in an aquifer also allows rapid and untreatable diffusion of pollutants. The two types of aquifers
- 30 are gravel and bedrock. Both can be unconfined or confined (not susceptible to surface water) and both
- 31 can be vast or limited in quantity and time of recharge. Septic tank effluent, leaking underground fuel
- 32 storage tanks, landfill leachate, agricultural runoff, or improperly stored hazardous wastes are potential

1	sources of groundwater pollution. The recharge water's passage through vegetation and soil must filter	
2	out such toxins; otherwise, the pollution is virtually impossible to remove from the aquifer and its use as a	
3	potable water supply would likely need to be discontinued or a water treatment plant would be required.	
4	Preventing pollution spills or leaks, creating or maintaining vegetated buffers, following accepted manure	
5	management practices, and establishing setbacks within recharge areas are effective methods of	
6	protecting drinking water supplies stored in aquifers.	C
7	Norwich Fire District Water Supply	a
8		
9	Connecticut River. It lies in an esker, a thick ribbon of sand and gravel left by a river that ran under the	
10	great ice sheet while it was retreating northward. The modern river cut through it, probably when ancient	
11	Lake Hitchcock was emptying, so that only its northern part is in Vermont; its southern part extends down	
12	through Hanover from the level of the Cold Regions Research and Engineering Laboratory (CRREL). The	
13	Fire District owns 27 acres of land at the south end of the Vermont part of the esker to ensure access to	
14	it.	
15	The town has incorporated an approximately 69-acre Primary Aquifer Protection Area into its zoning	
16	regulations that includes the Fire District's holdings and some of the gravel mine to the north. A	
17	Secondary Aquifer Protection Area includes the entire watershed (approximately 2,315 acres) of the	
18	stream that flows near the Primary Aquifer Protection Area. The current boundaries of the Primary	
19	Aquifer Protection District are based on hydrological studies conducted in 1990. The water quality of the	
20	well is affected by the water quality of the Connecticut River and therefore the actual area that needs to	
21	be monitored could be extensive. The Connecticut River, the railroad, Route 5 and Interstate 91 all pass	
22	near the esker. A major toxic spill on any of these might contaminate the district's drinking water supply.	
23	Given that a portion of the aquifer re-charge comes from the Connecticut River, which is controlled by	
24	the State of New Hampshire, continuing cooperation between the two states is important for	
25	safeguarding this resource. An interstate aquifer protection district has been proposed, but not yet	
26	implemented.	C
27	In summary, there is an ongoing critical need to protect the aquifer that supplies Norwich village and	
28	other sources of drinking water, and to identify major sources for future needs. Only with planning,	

- 29 education, and action can Norwich assure its citizens that their water and health will be safeguarded from
- 30 harmful micro-organisms and toxic chemicals. Protecting groundwater deserves the highest priority in
- 31 formulating plans for the future of Norwich.

Comment [RF6]: Reference aquifer protection area map, any DEC regs and shorten

Comment [RF7]: Follow up

1 Surface Water

2 Connecticut River

Norwich is located along the Connecticut River, which forms the town's 7.8-mile eastern border. The
 Connecticut River is probably Norwich's most valued natural, recreational and scenic resource, and has
 been recognized as a national treasure through its designation as an American Heritage River in 1998. The
 Connecticut River travels 410 miles from its source in a small lake near the Canadian border to flow into
 the Atlantic Ocean at Long Island Sound.

8 The river gathers the flow of 24 major tributaries and thousands of small streams that originate in the
 9 mountainous uplands of Vermont and New Hampshire. Its watershed encompasses 41 percent of
 10 Vermont's land mass and one-third of New Hampshire's. Between the two states, 52 communities, in
 11 addition to Norwich, have a boundary defined by the river. The river can be seen as a living thread that
 12 has tied, and continues to tie, the people along its entire length together in one long valley community.

13 Recent decades have seen the river's resurgence as an important natural and recreational resource. First

14 for Native Americans, then for early European settlers, the Connecticut River was an important corridor

15 for travel and commerce. By the 20th century, the historic practice of dumping waste directly into the

16 nearest stream or river so unwanted pollution would wash away with the flowing waters resulted in

major rivers like the Connecticut becoming virtual cesspools whose downstream waters could barelysupport life.

19 In recent decades, the river's water quality has markedly improved as upstream communities have

20 installed wastewater treatment plants, and direct discharges of untreated effluent into surface waters

21 have been outlawed. Work remains to be done to clean the river, and prevent pollution from entering its

22 waters. Attention is now being paid to non-point sources of pollution, especially storm water runoff from

23 developed property and nutrient-loading from agricultural lands.

24 Currently, the Connecticut River as it flows past Norwich is considered Class B according to state and

25 federal water quality standards. Class B waters are managed for aesthetic values, recreation on and in the

water, public water supply with disinfection and filtration, high quality habitat for aquatic plants and animals, irrigation and other agricultural uses.

28 The entire Town of Norwich is located in the Connecticut River watershed, which means that all runoff

29 and surface waters drain to the river. The town is divided into several sub-basins as shown on Map 7X.

30 Most of town drains directly to the Connecticut River via Blood Brook and its tributaries or several other

small streams that flow directly to the Connecticut. An area in the northeastern portion of town drains to

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- the Ompompanoosuc River, while areas to the west drain to the White River; both rivers are tributaries of
 the Connecticut.
- 3 The Connecticut River Joint Commission includes New Hampshire's Connecticut River Valley Resource
- 4 Commission, created by the legislature in 1987, and Vermont's Connecticut River Watershed Advisory
- 5 Commission, similarly created in 1988. These commissions are is charged with cooperating inan order to
- 6 preserve and protect the resources of the Connecticut River Valley, and to guide its growth and
- 7 development. The commissions are is advisory and has venoregulatory powers, preferring instead to
- 8 advocate and ensure public involvement in decisions that affect the river and its valley, including
- 9 <u>relicensing hearings conducted by the Federal Energy Regulatory Commission (FERC)</u>. The Upper Valley
- 10 River Subcommittee addresses local issues and concerns.

11 Ompompanoosuc River

- 12 The Ompompanoosuc River flows into the Connecticut River in the northeastern corner of town. Only the
- 13 final three miles of the river's total 25-mile length are in Norwich. The river is impounded by the Union
- 14 Village Dam, which was completed in 1950 as part of a U.S. Army Corps of Engineers project for flood
- 15 control. Segments of the Ompompanoosuc River upstream of Norwich are on the state's list of impaired
- 16 waters. The Elizabeth Mine, an abandoned copper mine in South Strafford approximately seven miles
- 17 upstream from the Union Village Dam, is leaching highly acidic runoff into the West Branch of the
- 18 Ompompanoosuc River from a 40-acre tailings pile. The site has been listed as a federal Superfund site
- and awaits funding for cleanup. The region has a history of copper mining, and several other sites are also
- 20 likely leaching metallic compounds into the river.

21 Public Access

- 22 Today Norwich's rivers and streams are used extensively by residents and visitors for boating, swimming
- 23 and fishing. No longer corridors for commerce and industry, waterways are being rediscovered as
- 24 recreational, scenic and natural resources. The railroad line from White River Junction to Wells River, built
- in the mid-1880s, limits access to the Connecticut River, yet has also protected the shoreline.
- 26 There are only two public water access points in Norwich: a small site north of the Ledyard Bridge on
- 27 River Road owned by the Ttown, and another belonging to the Vermont Department of Fish and Wildlife
- 28 on the Ompompanoosuc. A state-owned primitive canoe campsite, accessible from the river, provides for
- 29 low-impact recreation. A spot for public swimming on the Ompompanoosuc River or Connecticut River
- does not exist in Norwich, though potential sites exist. Currently, there are no incentives to landowners to
- 31 create greenways along the rivers.
- 32 The Montshire Museum of Science owns more than 2,000 feet of Connecticut River shoreline property,
- 33 including land on both sides of the railroad right-of-way. The Montshire's property includes an inlet, the

- 1 lagoon, where Blood Brook enters the Connecticut a favorite spot for shoreline birds and other animals,
- 2 as well as recreational boaters. The Montshire's web of trails includes one along part of the shoreline. Its
- 3 private canoe access in the lagoon and its shoreline trail are open to visitors of the museum.

4 Small Streams

- 5 In addition to the two main rivers, there are a number of smaller streams and brooks in Norwich, as
- 6 shown on Map 7. The largest of these is Blood Brook, which arises on the slopes of Gile Mountain in the
- 7 northernmost corner of the town and empties into the Connecticut River near the southernmost corner,
- 8 running almost the entire diagonal length of the town. Its two largest tributaries are the Charles Brown
- 9 Brook from the northwest and the New Boston Brook from the north-northeast. A smaller branch, Bragg
- Brook, joins near the south end of town. Dothan, Podunk, Tigertown and Mitchell brooks flow southward
- 11 toward the White River. Avery Brook flows into the Ompompanoosuc River from northeast Norwich
- 12 through Thetford.
- 13 All of these brooks have beautiful, clear tumbling water and are recreational resources, to walk alongside
- 14 or fish. They support wildlife and provide natural corridors that facilitate travel for many species. They
- also contribute to the recharge of groundwater supplies, but they are not regularly tested. The quality of
- 16 water in the town's brooks and streams needs to remain high to support these uses.

17 Lakes and Ponds

- Norwich has one large kettle-hole pond, Star Lake, within its boundary. A portion of the constructed
 Norford Lake crosses Norwich's boundary from Thetford. There are a number of small ponds supported
 and controlled by beavers, two of which are ponds at the headwaters of Avery Brook and Mitchell Brook.
 Other small ponds are associated with larger wetland complexes and many are a result of beaver activity
 along the town's many brooks.
- 23 While beavers sometimes cause flooding that can damage the built environment and working timber stands, overall they are generally beneficial to the natural environment. The consequences of beaver 24 25 dams are very important for stream ecosystems and the terrestrial environments that surround them. New plant clusters develop on the flooded shorelines and the process of restoring natural rich vegetation 26 an support a diverse mix of species develops within the transition zones (or ecotones) that form 27 28 edges of the newly-created beaver ponds. Shallow warmer water creates the conditions needed for the creation of wetland vegetation and a swampy transition zone 29 and the land. 30 31 er ponds can help improve water quality and reduce downstream sedimentation. The fine sediments
- 32 and organic substances that fall on the bottom create a perfect substratum for the development of
- 33 aquatic vegetation. Thanks to the development of vegetation, the streambed is stabilized and the newly-

Comment [RF8]: All the following sections have way too much detail and do not relate directly enough to Objectives, Policies and Actions

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1	created complex not only catches the sediments, but also acts like a filter and a container of sediments
2	flowing in from the surrounding ecosystems. Due to the accumulation of organic substances, water
3	micro-organisms flourish and aid in the decomposition of pollutants. Beaver ponds also increase the
4	storage capacity within a drainage basin, reducing flooding during spring snow melt and storm events.
5	Water flow is slowed, reducing the potential for erosion and downstream sedimentation.
6	Riparian Buffers
7	In 20xx Norwich amended its Zoning Regulations to incorporate riparian buffers.
8	
9	[insert table]
	stream buffer
10	
10	
11	The maintenance and enhancement of shoreline vegetation is the simplest and most effective means of
12	protecting the many benefits and values associated with surface waters. Maintaining or planting naturally
13	growing woody vegetation alongside surface waters is essential to the health of streams and lakes.
14	Appropriate buffer width is related to stream bank slope and the purpose of the buffer. A 25-to 50 foot
15	buffer may increase stream bank stability and remove sediment on level land and moderate slopes.
16	Greater width would be needed on steeper slopes or where sediment loads are particularly high. In
17	addition to filtering pollutants, a 100-foot buffer will provide food, cover and breeding habitat for many
18	kinds of wildlife. Buffers of several hundred feet are necessary to provide habitat and corridors for some
19	species.
20	Appropriately, vegetated shorelines contribute to maintenance of water quality and shoreline protection
21	in the following ways:
22	Provide bank support and stabilization;
23	 Help prevent bank undercutting and bank collapse;
24	 Provide food and shelter for fish and wildlife, and corridors for wildlife movement;
25 26	 Intercept, absorb, and filter out pollutants such as silt, fertilizers, toxic chemicals, and livestock wastes;
27 28	 Keep water temperatures cool during hot summer months when fish are susceptible to heat stress;

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1	Slow surface water runoff;
2	Increase wildlife diversity;
3	 Reduce flood and ice damage to stream channels, and adjacent lands and structures; and
4	Preserve natural character of waters.
5	Wetlands
6	Marshes along rivers and streams, swamps, and bogs in woods, areas that are more or less regularly
7	soggy or inundated, are wetlands. Historically, wetlands have been considered a nuisance to be
8	eliminated, but they are now understood to be essential not only for the survival of many species of
9	plants and animals, but also for maintaining the health, safety, and welfare of the general public. These
10	fragile resources protect drinking water supplies by filtering out pollutants and by helping to recharge
11	aquifers. Wetlands minimize flood damage by temporarily absorbing and storing floodwaters. They also
12	present significant development constraints associated with poor drainage and high water tables.
13	The importance of wetlands has been recognized on a National level since the 1970's. Vermont adopted
14	legislation and rules in 1990. Wetlands of a size and/or quality to fulfill the functions mentioned above
15	are protected. These wetlands, Class I of national significance and Class II of statewide significance,
16	comprise less than five percent of the state's land area.
17	l Wetlands in Norwich included in the National Wetlands Inventory were initially regulated by the 1990
18	Vermont Wetland Rules as Class II wetlands and required a 50-foot buffer between development and the
19	delineated wetland. Some of the town's major wetland complexes are located in the brook valleys and
20	along the shore of the Connecticut River. The largest wetland in town is an approximately 65-acre area
21	along New Boston Brook. The 2010 Vermont Wetland Rules changed the definition of Class II wetlands
22	from those included in the National Wetlands Inventory to those meeting specific functional criteria
23	identified in the new rules. Most Class II wetlands are already included in the new Vermont Wetlands
24	Inventory. As additional class II wetlands are delineated they are added to the inventory.
25	Several "advisory wetland inventories" may assist in identifying where potential Class II wetlands may be
26	located. These include a Norwich Conservation Commission inventory based on 1992 infrared aerial
27	photos and limited field checking and a state inventory of "Potential Wetlands" based on NCRS hydric
28	soils maps.
29	Vernal Pools
30	Vernal pools are small wetlands characterized by a lack of woody vegetation resulting from the
31	persistence of standing water for a portion of the year. They typically occur in small depressions in upland

32 forests or less frequently in forested swamps. Vernal pools generally lack inlets and outlets, and collect

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1	water mainly from precipitation and snow melt. The pools are shaded by the surrounding forest canopy
2	and so can retain moisture well beyond "mud season." Depending on the amount of precipitation in a
3	given year, a vernal pool may be dry or still have standing water by mid-summer.
4	Vernal pools provide important breeding habitat for amphibians such as salamanders and frogs. In order
5	to support those species the pools need to retain their water during the late-spring/early-summer
6	breeding season. The pools are highly productive ecosystems that provide a rich source of food for a wide
7	variety of species.
8	Their small size and temporary nature make vernal pools difficult to inventory and protect. Construction
9	of roads, timber harvesting and other development in upland forests around vernal pools can negatively
10	affect the pools and the species that depend on them.
11	A partial inventory of vernal pools, mapped by the Norwich Conservation Commission in 2006 using
12	infrared aerial maps, is in the Norwich GIS and is shown on Map 8.
ا 13	Floodplains
14	As shown on Map 7, floodplains have been identified along the town's rivers and streams. Mapped
15	floodplains include those areas that have a one percent chance of flooding in a year. These areas
16	temporarily carry and retain bank overflow from spring runoff and heavy storms_, and are vital to the
17	health of the river and the safety of the community. Increased development and shifting weather
18	patterns have resulted in a number of serious flood events around Vermont in recent years.
19	The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs) show the
20	floodplain that FEMA has determined would be covered by water during the "100-year flood," which is a
21	storm event that has a 1% likelihood of occurring in any given year and which is referred to as the base
22	flood. This area of inundation is called the Special Flood Hazard Area (SFHA). FIRMs may also show
23	expected base flood elevations (BFEs) and floodways (smaller areas that carry more current).
24	There are approximately 50 homes and a small number of non-residential structures currently located
25	within the mapped special flood hazard area in Norwich. None of the town's critical facilities (ex., fire
26	station) are located in floodplains and there are no repetitive loss properties in Norwich as identified by
27	FEMA.
28	Norwich has adopted <u>special</u> flood hazard area regulations to limit development within flood hazard
29	areas, as required for municipal participation in the federal flood insurance program. These regulations
30	are intended to protect life and property, and to allow property owners to obtain flood insurance and

PAGE 14

1

2

mortgages at relatively affordable rates. The town needs to continue strictly restricting development within its floodplains to protect public health and safety.

3 FIRMS are only prepared for larger streams and rivers. Recent studies have shown that a significant

4 portion of flood damage in Vermont occurs outside of the FEMA mapped areas along smaller upland

5 streams, as well as along road drainage systems. Since FEMA maps are only concerned with inundation,

6 and these other areas are at risk from flash flooding and erosion, these areas are often not recognized as

7 being flood-prone. Property owners in such areas outside of SFHAs are not required to have flood

8 insurance. Flash flooding along smaller streams can be extremely erosive, causing damage to road

9 infrastructure and to topographic features including stream beds and the sides of hills and mountains,

10 and creating landslide risk.

11 River Corridors

12 In addition to the risks associated with inundation, there is the related hazard posed by storm-swollen

13 streams and rivers, which may unexpectedly jump their banks and cut new channels. Due largely to

14 human influences, many stream and river channels are no longer stable, especially in upland areas. Their

15 instability creates an erosion hazard during major storms, which as noted elsewhere in the plan, are

16 becoming more common as a result of climate change. Fluvial erosion hazards are often in locations that

17 are unlikely to be inundated with flood waters and are therefore not protected through existing

18 regulations that limit development in floodplains. Eroding stream banks are also a significant source of

19 sediment and polluting nutrients entering major rivers and lakes, which decreases water quality.

20 The Vermont Agency of Natural Resources has developed river corridor maps that show the areas subject

21 to erosion. In these areas, the lateral movement of the river and the associated erosion is a greater threat

22 than inundation by floodwaters. As with the FEMA FIRMs, the smaller streams have not been mapped

and a default 50-foot corridor of concern is defined from the top of bank of these streams. There are

24 approximately 15 homes currently located with the state-mapped river corridor areas, outside the special

25 flood hazard area, in Norwich. <u>Any property subject to Act 250 permit review has Rvicer Corridor</u>

26 <u>development restrictions</u>

27 Fluvial geomorphology seeks to explain the physics of flowing water, soils and land use in relation to

28 various land forms. It analyzes physical, chemical, biological and land use data to explain the historic

29 causes of the problems currently being experienced in stream corridors in an attempt to resolve or avoid

30 conflicts between fluvial systems and the built environment. A geomorphic assessment is currently

31 underway on Blood Brook in Norwich and the town is considering limiting development within identified

32 fluvial erosion hazard areas in a manner similar to current regulations within flood hazard areas.

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1	The Blood Brook Watershed Corridor Plan of March 2008 is the result of a three-phase study by the
2	Norwich Conservation Commission, the Two-Rivers Ottauquechee Regional Commission, and the
3	Vermont Agency of Natural Resources, Department of Environmental Conservation, River Management
4	Program. The purpose of that plan is to assess the underlying causes of channel instability and encourage
5	the stream's return to equilibrium conditions. The plan outlines management efforts directed toward
6	long-term solutions that help curb escalating costs and minimize the danger posed or damage caused by
7	storm-swollen streams. Such efforts can help reduce flood and erosion hazards along the river corridor,
8	improve water quality and aquatic habitat, and enhance aesthetic and recreational values of the stream.

Land Cover, Habitat and Wildlife 9

Forestland 10

Forest is the most common land cover type in Norwich accounting for nearly 22,000 acres or 11 12 approximately 76-77 percent of Norwich's land. Forest resources provide a number of benefits, including 13 an economic return for local landowners, water quality, wildlife habitat, recreation opportunities for town residents and visitors, and an important visual backdrop to the town's scenic views and vistas. Most of 14 15 Norwich's forestlands are in private ownership, but remain in tracts 50 acres or larger. The largest single 16 forest parcel is the 450 acres along the Appalachian Trail owned by the National Park Service. The Norwich Fire District owns a 330-acre parcel off Beaver Meadow Road. 17

Forests are a permanently renewable resource if managed properly. Sound forest management results in
a stable economic return for landowners, local resources to support local industry, and perhaps most
importantly, an incentive for keeping large tracts of land free of development and available to the public
for recreation, wildlife and scenic enjoyment. However, poor forest management can result in the
degradation of biological diversity and can damage scenic landscapes. Forest management can be
accomplished in a manner that does not create erosion or adversely impact scenic areas and wildlife.
Generally, a sound forest management plan should be based on a number of objectives, including
sustainable timber production, the protection of water quality, maintaining a diversity of wildlife habitat,
and aesthetic enhancement. Whatever the objectives of a forest property owner, developing and
implementing a forest management plan is the best means of managing a forest parcel for long-term,
sustainable forest production.
The majority of the town's forest land is privately owned. While much of the private forest is made up of
large parcels associated with single family residences, many undeveloped parcels under forest

- management also exist. Of the privately owned forestland in town, more than 11,000 acres are currently 31
- 32 enrolled in the state's current use program, and are therefore managed in accordance with a forest
- management plan approved by the county forester (see Figure 11-4). 33

1 Wildlife

T	Wildlife
2	In addition to its 3,400 human residents, Norwich is home to a variety of animal species. To survive, these
3	animals require substantial acreage, preferably in large, solid blocks interconnected by undisturbed
4	corridors for seasonal movement. The preservation of a diverse array of species requires more than
5	protection of identified deer wintering areas or bird nesting sites. Certain species such as black bear that
6	require large contiguous habitat areas, which also support a variety of other species, serve as indicators
7	of the health and diversity of local wildlife populations.
ð	In Norwich, forested upland areas are nome to bear, deer, bobcat, moose and coyote. The connecticut
9	River and its tributaries support natural and stocked populations of brook, brown and rainbow trout. The
10	Connecticut River is also a major route for bird migration. The marshes and other wetlands along the
11	Connecticut River provide migrating songbirds and raptors with food, water and shelter. Numerous
12	species of waterfowl, including ducks, egrets and blue herons, occur along the river. Non-game small
13	mammals such as beavers and otters that need continuous access to water abound along the river.
14	Wetlands also provide critical habitat for a variety of species such as mink, otter, beaver, black bear, grey
15	fox, moose, ducks, herons, other wading birds and shore birds and other species.
16	Special natural areas contribute to the quality of life in Norwich, promoting species diversity, aesthetic
17	enjoyment, recreation and education. Natural areas in Norwich include orchid swamps, peat bogs, vernal
18	pools, fall-line gorges, estuaries and deer yards. Natural areas can be identified and graded in order of
19	their uniqueness or significance. Such an assessment would provide direction for conservation efforts.
20	Important natural areas can be protected through purchase, through encouraging landowners to seek
21	permanent conservation protection, and through careful review of proposed development.
22	The main threat to wildlife habitat is fragmentation. Figure 11-3 illustrates the impacts of land subdivision
23	and fragmentation of large tracts of forestland on wildlife populations in northern New England. The left-
24	hand column identifies expected species in large tracts of undeveloped forest, while each subsequent
25	column depicts the species likely to be lost as the land is subdivided into smaller parcels for scattered
26	development.
27	In order to maintain habitat for animals that have large home ranges, such as bear, bobcat, fisher, and
28	moose, and other animals that are sensitive to human disturbance, such as wood thrushes, larger blocks
29	of forest or meadowland, or wetland habitat need to be conserved. Blocks up to 20 acres are home to
30	species typical of urban and suburban landscapes (e.g., raccoons, skunks, and squirrels). Moose, bald

- 31 eagles, goshawks and similar species usually require 500 to 2,500 acres, while blocks of more than 2,500
- 32 acres may hold the full complement of species expected to occur in this region of Vermont.
- 33 Within Norwich, a number of large, unfragmented blocks of forest remain, including:

1 2	 2,600 acres between Beaver Meadow and Turnpike Roads, which continues into the Town of Sharon
3	• 2,000 acres south of Bragg Hill Road
4	1,500 acres between Upper Turnpike Road and New Boston Road
5 6	 1,400 acres between Turnpike Road and Upper Turnpike Road, which continues into the adjoining towns of Sharon, Strafford and Thetford
7	1,000 acres between New Boston Road & Bradley Hill Road
8	Maintaining contiguous forested lands within Norwich, as well as between Norwich and neighboring
9	towns, protects wildlife habitats found in core forests and provides corridors that connect larger blocks of
10	forest.
11	While many residents enjoy hunting, fishing, wildlife viewing and have extensive knowledge of local
12	wildlife and fisheries, the information has not been documented. Most of the town's important wildlife
13	habitats have not been inventoried or mapped. The extent of documented knowledge about wildlife
14	habitat in Norwich is surprisingly limited, in part because of the amount of fieldwork and mapping needed
15	to document local populations. For this reason, site-specific evaluations may be required to determine

16 the potential impacts to wildlife and important habitat associated with a particular subdivision or

17 development proposal.

18 Scenic Resources & Rural Character

19 Norwich is appreciated by most of its residents as a quiet community for rural living. Commercial

- 20 development is limited to retail and service establishments on Main Street (Village Business District) and
- 21 Route 5 (Commercial/Industrial District). The many small businesses and offices that residents operate
- 22 from their homes remain inconspicuous. The town green and the historic homes along or near Main
- 23 Street are a visual reminder of the community's heritage. Abandoned cellar-holes and granite posts mark
- 24 former homesteads of the town's founding families and their descendants.
- 25 Norwich is no longer primarily an agricultural town, but retains a few moderately-sized farms and much
- 26 rural character. Open country and meandering roads that follow lively brooks between forested slopes
- 27 lead to small development clusters with names like Beaver Meadow, Union Village, Pompanoosuc and
- 28 Podunk. The Connecticut River with its tributary, the Ompompanoosuc, open fields and remaining
- 29 patches of pasture add to the variety and beauty.
- 30 Yet, as the town's landscape continues to change, residents recognize that Norwich's rural character is
- 31 threatened. The views from the roads, fanning like fingers of a hand from the Norwich village area, are
- 32 changing as more homes are built, so that passersby are required to look between houses to glimpse the

view beyond. This section of the plan describes the main elements of Norwich's rural character - its 1 agricultural and forest lands, brooks and wetlands, wildlife and vulnerable habitats, scenic roads and 2 3 vistas, historic buildings and sites, views of the night sky and a quiet environment. Other elements, such as the traditional village settlement pattern and clustered housing in relation to open space, are 4 ussed in other sections of the plan, but are equally important in a discussion of natural resource 5 order to preserve rural character, it is necessary to identify the elements of Norwich's natural and built 6 7 ment that creates that character. 8 Scenic Resources 9 farmland to the town's upland forests to the west and across the Connect vistas across ope River toward the White Mountains to the east create a landscape of great scenic beauty in Norwich. A 10 area can be one with views of farmsteads surrounded by pasture, of compact villages 11 12 among hills, and of arching trees over dirt roads. It can also be views of mountain ridgelines seen across a level or gently rolling field. These areas combine elements of contrast, reflect order and harmony, and 13 contain intact patterns and focal points. Scenic beauty is linked to the visual relationships between the 14 built environment, open farmland, mountains and rivers. 15 vich's scenic beauty and rural character is beavily influenced by the patchwork pattern of meadow 16 and forest resulting from more than two centuries of farming. The beauty of the agricultural landscape 17 18 the productive use of the land and its seasonally changing colors, textures and patterns. 19 Open lands are responsible for the wide and distant views found along many of the town's roads. Striking views that include forested mountains in the distance with a foreground and middle ground of rolling 20 21 countryside can be seen from many vantage points in town, and have nearly universal appeal as scenic 22 resources. 23 Scenic Vistas and Roads

The Natural Resources Questionnaire circulated to Norwich residents in 1988 brought out nominations
 for scenic areas from nearly all respondents and included roads through most of the fall-line gorges that
 followed tumbling brooks through unbroken forest; for instance, the Crooked Half-Mile, lower Bragg Hill
 Road and Tigertown Road. Views considered the best were those from the top of Gile Mountain, upper
 Bragg Hill, Bradley Hill, and along the Connecticut River. Special areas included the town Green in fall
 foliage season, the New Boston beaver ponds, the Norwich Grand Canyon, and the Van Arman and Smith
 farms.

The 360-degree panorama from the fire tower atop Gile Mountain is one of the area's most extensive and accessible vistas. On a clear day, a half-hour walk offers views of both the Green Mountains and White Mountains, along with much of the Connecticut River valley stretching between the two.

1 In 2003, the Norwich Conservation Commission undertook to-produced the Norwich Open Space 2 Priorities Informal Plan which enumerated Norwich's significant open spaces. in the belief that a rational 3 open space system is fundamental to maintaining and enhancing the character of the town as it grows. (See Chapter 9 for a further discussion of scenic roads.) 4 5 **Ridgelines** 6 The scenic qualities of a forested ridgeline or hillside silhouetted against the sky, can be compromised by 7 poorly planned development, such as inappropriate building placement, site design, material selection and excessive clearing. While they are some of the most visually sensitive areas of town, Norwich's 8 hillsides and ridgelines are highly desired locations because of the views they offer. It is possible to locate 9

development in the town's uplands in a manner that preserves the scenic qualities of the landscape.
 Landowners wanting a more open view in a forest setting can limb trees and selectively cut branches to
 create view corridors rather than clear cut a swath of trees. As described before, the town's hills and
 ridgelines have been identified as a critical component of its scenic character. The town's Ridgeline
 Protection Overlay district was designed to protect these fragile and beautiful features of the town's

15 landscape.

16 Rural Character

17 Open Space

18 Compact village clusters surrounded by open space - all land that is not built on - help define the 19 character of Norwich as a New England town with roots deep in the past. Open meadows, fields and 20 woods contribute to the enjoyment of residents and visitors alike as they walk or ride along the town's roads and trails; they are an essential part of Norwich's scenic beauty. Farmlands preserve open stretches 21 22 viewed from Interstate 91 and Route 5, as well as closer to town and along Union Village Road. Other 23 open lands are vital parts of favorite areas, such as Bradley Hill Road and Bragg Hill Road. Farm fields and 24 pastures, which comprise less than 15 percent of the town's land area, are critical to retaining views, 25 especially for travelers on the town's roads.

Norwich is fortunate that it retains much of its open space. Currently, less than 10 percent of the town's
 land area has been developed, yet parcels are being continuously subdivided and developed. Remaining
 areas should be identified and prioritized for possible protection. Landowners can be encouraged to do
 this through conservation easements, development plans that group or cluster houses together leaving
 the remaining land as preserved open space, and estate planning that considers the future use of the
 land.

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1 Agricultural Structures and Patterns

2 Historic farmhouses, barns and other agricultural outbuildings are also essential components of the town's rural character. They are an architectural connection to the town's history and heritage as a 3 4 farming community. Other visual reminders of the agricultural use of Norwich's land are the stone walls 5 and hedgerows that define the edges of fields and meadows. They create a recognizable pattern on the landscape that reinforces the town's rural character. While farmsteads, fields and pastures may pass from 6 productive to residential use, the architectural elements and visual patterns can provide a framework for 7 appropriately locating and designing development so that it fits into a rural environment. New uses can 8 9 be found for obsolete farm structures, giving them new life while maintaining their architectural integrity. Lighting 10

The skies above and the views from and toward Norwich are appreciated at night as well as day. The
 ability to enjoy a view of the night sky without the intrusion of artificial lighting is another component of
 the town's rural character. The ability to enjoy the night sky can be reduced by excessive and unshielded
 lighting. Public safety and welfare require adequate illumination in proper places, but excessive lighting
 may produce unsafe or unpleasant conditions in which unshielded light glares into the eyes of drivers and
 into houses. Excessive lighting also unnecessarily consumes energy.

Noise. Intrusive noise is out of character in a rural setting, where people expect a quiet atmosphere
 interspersed with natural sounds like bird songs or flowing water. Traffic and other sources of noise can
 diminish rural character.

20 Trails and Greenways

21 Appalachian Trail

The Appalachian Trail, a 2,178 mile, continuous hiking trail from Mt. Katahdin, Maine to Springer
 Mountain, Georgia travels more than five miles through Norwich. The National Park Service owns 697
 acres around the trail in Norwich. After traversing about two miles by roadway from Ledyard Bridge via
 Main Street to the trail entrance near the top of Elm Street, the trail generally follows the ridgelines that
 define the southern part of the Blood Brook watershed. The Dartmouth Outing Club maintains this
 segment of the trail.

- 0
- 28 The Appalachian Trail Conference and Upper Valley Land Trust worked to acquire and hold conservation
- easements on abutting lands to create a buffer for the trail. In Norwich, 556 acres adjacent to the trail
- 30 corridor have been conserved in addition to the lands owned by the National Park Service. Altogether,
- 31 this protected greenway corridor represents four percent of Norwich's land area.

- 1 This major open space corridor serves as a backbone of protected recreational land and has been a
- 2 driving force to develop an interconnected trail system throughout the town. Connections currently exist
- 3 from the Appalachian Trail to the following town trails and roads: Cossingham Trail, Tucker Trail, Happy
- 4 Hill Road, Burton Woods Road, Brown School House Road, Ballard Trail, Gile Mountain Ridge Trail, Heyl
- 5 Trail, Elm Street, Bragg Hill Road, Hopson Road and the informal trail under the power transmission line.
- 6 Ecologically, the Appalachian Trail corridor provides habitat for a diverse array of plant and animal
- 7 species. It travels through a forested landscape with an understory of ferns and wildflowers to emerge
- 8 briefly for expansive views on its path from Elm Street over Bragg Hill to the Jericho area and on into
- 9 Hartford. The protected corridor is an excellent example of the Northern Hardwood Forest natural
- 10 community and the related Hemlock Northern Hardwood Forest community. The area includes some
- 11 important wetlands and an area of mesic forest, which is home to a number of rare plant species.

12 Town Trails

- 13 Norwich's trails and greenways provide a valued resource for citizens and visitors. A favorite bicycle and
- 14 jogging route travels along the Connecticut River on the River Road and then extends north into Thetford.
- 15 Another walking and jogging route for residents and visitors alike makes a loop on Route 5 south and
- 16 Hopson Road, taking advantage of the open spaces of the Booth property and the Warner Meadow, both
- 17 protected with conservation easements donated to the Upper Valley Land Trust.
- 18 The Milton Frye Nature Area adjacent to the Marion Cross School is readily accessible to school children 19 and the general public close to the center of town. With interpretative stops, it helps to educate classes
- 20 of school children and others, as well as to provide a peaceful respite. Trails owned by the town, leading
- to Gile Mountain (the highest peak in town) and to the Schmidt Preserve with its showy lady slippers (a
- 22 rare plant species), provide access to other favorite spots in the fall and spring, respectively. Another
- 23 resource, the Bill Ballard Trail, follows the Charles Brown Brook down the length of the Fire District
- 24 watershed land.
- 25 A trail created by the mutual efforts of the Montshire Museum and the conservation commissions of
- 26 Norwich and Hartford leads from the museum to Wilder Village. It and other Montshire trails one for
- 27 finding wildflowers and one along the Connecticut River are valued assets.
- 28 Class 4 roads and numerous trails are used by hikers, bikers, horseback riders, cross-country skiers and
- 29 snowmobilers. Many are not identified on maps. Some roads and trails could be interconnected to
- 30 provide a continuous network, both in Norwich and adjoining towns. Ways may be found to provide safe
- hiking and biking passage to the Huntley Meadow from the center of town.

1	Trails in Norwich with permanent easements or on public land are mapped and included in the Norwich
2	GIS and are shown on Map 4 <u>x</u> . Opportunities to interconnect existing trails need to be explored. Other
3	corridors of open space need to be identified and landowners encouraged to protect them, perhaps using
4	the Appalachian Trail Corridor as a model and creating links to it.
5	Historic and Cultural Resources
6	
7	are key elements of the town's traditional settlement pattern, energy sustainability, scenic resources and
8	rural character, and economic sustainability.
9	Norwich's iconic town center results from centuries of town settlement, construction, and preservation
10	of distinctive houses, public buildings, places of worship, and commercial buildings. This town center is
11	the focal point for the broader town made special by its rural character and scenic resources.
12	Long time residents have protected these qualities while more recent residents choose to live in Norwich
13	in part because of its sense of place and character. These qualities thus contribute to Norwich's strong
14	property values and the viability of its town center.
15	Norwich's historic resources range from undisturbed Native American sites to Civil War letters; from
16	historic buildings to portraits of those who owned them, and from 18th-century account books to 20th-
17	century photographs. The diversity of historical documents within the town and in nearby repositories is
18	staggering, but myth often replaces fact. Our historical resources furnish the elements of truth often
19	obscured in fanciful folklore. For instance, Blood Brook is often described as the site of an Indian
20	massacre. The closest Native American conflict to Norwich was the raid on Royalton on October 16, 1780.
21	Blood Brook more likely received its name because of the tanneries located on its banks.
22	Norwich's historical resources are recognized at the local, state and national levels. The Norwich Village
23	Historic District is listed in the National Register of Historic Places and numerous historic structures are
24	identified in the state's historic register. Resources buried in the earth, built on the landscape and
25	preserved in town archives are used on a daily basis. They are integral to, and help to define, the town's
26	unique sense of community through the years.

27 Archaeological Resources

28 Native American Resources

- 29 Although few of the town's archaeological sites have been identified and fewer still studied, it is possible
- 30 to predict, based on environmental characteristics, where certain kinds of prehistoric Native American

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1	sites would be more likely found. Results from archaeological investigations around Vermont in recent
2	decades suggest that prehistoric sites are typically located within 300 to 500 feet of an existing or relict
3	water source, on gently sloping land, or adequately drained soils with a southeast-south-southwest
4	exposure. These lands provided essential resources that attracted human populations. People exploited
5	these resources and left behind archaeological remains of their activities at these locations.
6	In Norwich, the confluences of the town's rivers and brooks on the rich alluvial plains adjacent to the
7	Connecticut River are known to harbor vestiges of civilizations that pre-date colonial settlement by
8	thousands of years. The Ompompanoosuc River (the Native American name meaning 'place of very white
9	stones') is associated with Native American heritage. From Gile Mountain and Griggs Mountain to Brown
10	Brook and Blood Brook, and the Connecticut River, all have the potential for revealing evidence of Native
11	American activity. In 1994, a Marion Cross Elementary School student located a projectile point during a
12	casual walk on the Fire District land.
13	It is important to recognize and respect the importance of these ancient dwelling, hunting and burial sites
14	and not to disturb or pilfer them for curiosity's sake. Casual 'digs' destroy the ability of professional
15	archaeologists to accurately date and study buried artifacts. The Vermont Division for Historic
16	Preservation should be contacted if a site is inadvertently unearthed. Not every site is worthy of
17	preservation, but an expert should be called to assess the find.
1.0	Colonial Resources
10	Archaeology also talls us a lot about the colonists who same to sottle in what would become Nerwish. As
19	for as is known, none of the existingly houses built by the partiast calorists. Joseph Fonton, the Uutobingens
20	
	and us is known, none of the original houses baile by the callest colonists - sacob rentant, the nucleum sons
21	or the Messengers – survive. Throughout Vermont, examples of pre-Revolutionary War architecture are
∠⊥ 22	or the Messengers – survive. Throughout Vermont, examples of pre-Revolutionary War architecture are rare, as many buildings were destroyed during the war. Archaeological research, coupled with
21 22 23	or the Messengers – survive. Throughout Vermont, examples of pre-Revolutionary War architecture are rare, as many buildings were destroyed during the war. Archaeological research, coupled with information from primary manuscripts, would likely locate the archaeological remains of the first town's
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21 22 23 24 25 26 27 28	or the Messengers – survive. Throughout Vermont, examples of pre-Revolutionary War architecture are rare, as many buildings were destroyed during the war. Archaeological research, coupled with information from primary manuscripts, would likely locate the archaeological remains of the first town's homesteads, mills and other structures. <u>18th and 19th Century Resources</u> Excavations around the Marion Cross School during construction of the 1993 addition uncarthed cadet buttons, eating utensils, clay pipes and ceramic plates used at Norwich University. A gnarled piece of iron found at the site illustrates the heat of the fire that destroyed the south barracks in 1866, leading to the
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 21 22 23 24 25 26 27 28 29 30 31 32 	or the Messengers – survive. Throughout Vermont, examples of pre-Revolutionary War architecture are rare, as many buildings were destroyed during the war. Archaeological research, coupled with information from primary manuscripts, would likely locate the archaeological remains of the first town's homesteads, mills and other structures. 18th and 19th Century Resources Excavations around the Marion Cross School during construction of the 1993 addition uncarthed cadet buttons, eating utensils, clay pipes and ceramic plates used at Norwich University. A gnarled piece of iron found at the site illustrates the heat of the fire that destroyed the south barracks in 1866, leading to the university's move to Northfield. Granite posts along the road and ripples in the land tell of the rich manufacturing history of potash works, blacksmith shops, tanneries and orchards. Near many of Norwich's 18th and 19th century homes are 'trash pits' where domestic refuse was dumped. With time, these textured soils become a buried record of lifestyle. Ceramic bits found in these historic dumpsters
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1	samples) recently found near the Norwich Inn suggest that 19th-century dinners were served on fancy
2	Chinese porcelain plates.
2	Although largely gone from the landscape. Nerwich's industrial history can be understood through
2	Anthough largery gone from the landscape, wor wich sindustrial instory can be understood through
4	archaeology. For instance, the Pattersonville chair Factory was located on the Ompompanoosuc. while
5	the factory was originally composed of more than nine buildings including sawmills, warehouses and a
6	company store, only two structures remain. Together with photographic documentation and business
/	records, the archaeological potential of the site is rich. Lewiston village, once a thriving community with
8	stores, homes, sawmill, icehouse and railroad depot, was razed when the interstate ramps were built in
9	the 1960s. Three existing buildings, photographs, maps and concentrations of archaeological resources
10	document the history of this site.
11	Historic Resources
12	Material Culture
13	Material culture is an academic phrase for what can be described as above-ground archaeology. The
14	study of material culture focuses on structures and objects like buildings, bridges, roads, domestic
15	furnishings, tools and machines to better understand history through the daily life of the time. It
16	complements the traditional study of history by linking the written word to the three-dimensional world.
17	Norwich's history, in large part, can be understood by driving along Main Street, where impressive
18	neoclassical houses speak of an affluent, highly style conscious community. Large, hipped roof houses
19	with connected barns and out-buildings along outlying roads tell of well-off farmers and a complicated
20	network of trade and commerce.
20	
21	Historically, houses and outbuildings were built with convenience and practicality in mind. Until recently,
22	the latter (barns, wood sheds, stables, sugar and milk houses, chicken coops, hog houses, etc.) were
23	integral parts of domestic space in Norwich. Some of these structures have been renovated and adapted
24	to current needs. Others have fallen into disrepair, eventually to become part of the archaeological
25	record rather than visual landscape. In addition to recording a way of life and use of resources,
26	farmhouses, barns, outbuildings are an essential component of the town's rural character, as described
27	elsewhere in this plan.
28	Primary Resources
29	The artifacts of Norwich's history are diverse and plentiful. The Norwich Historical Society seeks to
30	"preserve and interpret items from Norwich's past" including textiles, ceramics, paintings and prints,
31	maps, letters and photographs. Thus, there is a repository for the safe-keeping of items found in homes,
32	businesses, antique shops and flea markets that directly relate to town history.

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1	Records at the Town Clerk's Office and at the county seats in Woodstock and Middlesex are also
2	invaluable resources for telling the complex story of Norwich's settlement and development. The
3	Vermont Historical Society, Shelburne Museum, Bennington Museum, Special Collections at Dartmouth
4	College, and Norwich University archives are additional repositories for historical resources. Family
5	archives are another important resource. Many Norwich homes house heirlooms in attics, cellars, closets
6	and trunks. While the 18th and 19th centuries intrigue us, Norwich's 20th-century history is just as
7	significant. It is perhaps the century that has witnessed the most change in the town's daily routines.
8	Architectural Resources
9	Norwich's architectural heritage is one historic resource that is unmatched in the Upper Valley. Norwich
10	village (Main Street and adjacent side streets) was placed on the National Register of Historic Places in
11	1991 because it retains its early scale and architectural integrity. The Beaver Meadow Union Chapel was
12	listed on the National Register of Historic Places in 1995. The classification is honorific and does not place
13	restrictions or covenants on the buildings. Numerous buildings throughout town are also listed on the
14	state historic register.
15	<u>Ulder Buildings and Energy Sustainability</u>
16	Although retrofitting older buildings to increase energy efficiency may be expensive, the actual cost in
17	
	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new
18	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient
18 19	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of
18 19 20	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to
18 19 20 21	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to these more direct costs, the embodied energy—energy used to create the materials and construct the
18 19 20 21 22	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to these more direct costs, the embodied energy – energy used to create the materials and construct the original building – will also be lost. Many of the newer techniques for evaluating energy efficiency and
18 19 20 21 22 23	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to these more direct costs, the embodied energy energy used to create the materials and construct the original building - will also be lost. Many of the newer techniques for evaluating energy efficiency and sustainability in construction take these factors into account. The retrofitting of older buildings may also
18 19 20 21 22 23 24	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to these more direct costs, the embodied energy – energy used to create the materials and construct the original building – will also be lost. Many of the newer techniques for evaluating energy efficiency and sustainability in construction take these factors into account. The retrofitting of older buildings may also qualify for many tax credits, grants, and low interest loans created to support both historic preservation
18 19 20 21 22 23 24 25	energy consumption of demolition, disposing of the used materials, manufacturing and transporting new materials, and construction will often make retrofitting of existing older buildings a more energy efficient and sustainable option. These factors should be considered when making decisions regarding the fate of older and, more importantly, historic buildings that have become functionally obsolete. In addition to these more direct costs, the embodied energy – energy used to create the materials and construct the original building – will also be lost. Many of the newer techniques for evaluating energy efficiency and sustainability in construction take these factors into account. The retrofitting of older buildings may also qualify for many tax credits, grants, and low interest loans created to support both historic preservation and energy efficiency.

26 **Goals, Objectives and Actions**

- 27 <u>Goal I</u>
- 28 Maintain and improve the quality of our air, water, wildlife and land resources.

29	Objective I.1 Maintain the high quality of the town's air resources by discouraging uses and	Comment [RF9]: No authority to regulate
30	practices that generate air pollution.	
31	Action I.1.a Monitor local sources of air pollution.	

1	<u>Action I.1.b</u> Promote use of efficient, less polluting technologies to heat buildings,	
2	especially non-polluting wood-burning practices.	
3	Action I.1.c Consider the impacts of new development on traffic congestion that would	
4	result in increased air pollution.	Comment [RF10]: No authority to review air pollution as part of congestion only traffic impact
5	Action I.1.d Support efforts to raise weight limits to allow heavy trucks access to	
6	Interstate 91 rather than being required to travel on Route 5 through the village area.	Comment [RF11]: Move to transportation chapter
7	Action I.1.e Collaborate with neighboring communities and Advance Transit to provide	Comment [RF12]: As above
8	mass transit services for Norwich residents as a means of reducing air pollutants from	
9	private vehicle emissions.	
10	Action I.1.f Promote compact development patterns, consistent with the size and scale of	
11	existing developments in Norwich, as a way to reduce air pollution by decreasing	
12	automobile dependence and increasing the feasibility of mass transit.	
13	Action I.1.g Use the town's zoning regulations to control dust from activities such as	
14	construction sites, and resource extraction and processing operations,	Comment [RF13]: Construction phase practices can be regulated, mining and quarrying are subject
15	Objective L2 Ensure the responsible use of gravel and sand resources to provide long-term	to state permits. ToN has no jurisdiction
16	benefit to the town.	
17	Action 1.2 a Identify sand and gravel denosits, and conserve these limited resources for	
18	future uses.	
19	Action I.2.b Use the town's zoning regulations to require the use of appropriate	
20	techniques to minimize environmental impact of sand and gravel extraction and provide	
21	for reclamation of the land.	
22	Action 1.2.c Require all applicants for resource extraction operations to prepare, submit	
23	and implement erosion control, stormwater management and site restoration plans.	
24	Action 1.2.d Require all applicants for resource extraction operations to operate in a	
25	manner that avoids or minimizes impacts to natural, scenic and historic resources, public	
26	infrastructure and quality of life for nearby residents to the greatest extent feasible.	
27	Action I.2.e Require adequate stormwater management and erosion control measures	
28	for stockpiled sand, gravel, soil, salt or other similar materials.	
29	Action 1.2.f Prohibit the stockpiling of sand, gravel, soil, salt or similar materials in areas	
30	adjacent to public water supplies, identified aquifers and surface waters.	

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1 2	<u>Objective I.3</u> Encourage the preservation of prime agricultural soils and viable tracts of productive farmland.
3	Action I.3.a Promote landowner participation in the state's current use program.
4	Action 1.3.b Explore other methods to reduce the property tax burden of maintaining
5	viable tracts of productive farmland.
6	Action 1.3.c Continue identification and evaluation of active and potential agricultural
7	lands by methods such as the Land Evaluation and Site Assessment for Farmland (LESA)
8	program.
9	Action I.3.d Use Norwich's zoning and subdivision regulations to promote the
10	conservation of farmland by permitting homes to be clustered while maintaining viable
11	tracts of productive farmland.
12	Action I.3.e Encourage development to be located along the edges of fields or on the
13	least productive land in order to preserve primary agricultural soils, allow for continued
14	agricultural use and maintain the scenic character of Norwich's rural landscape.
15	Action I.3.f Designate development envelopes on lots being created or newly built upon Comment [RF14]: Already done
16	to ensure that buildings are sited to minimize impacts on agricultural soils and productive
17	farmland.
18	Action I.3.g Encourage adjacent lots to share roads, drives and utility corridors whenever
19	feasible to limit fragmentation of agricultural soils and productive farmland.
20	Action I.3.h Support the ability of current and future residents to grow food locally by
21	promoting the conservation of agricultural soils, including pockets not large enough to
22	support traditional farming operations.
23	Objective I.4 Maintain the town's steep slopes in a manner that prevents erosion, changes to Comment [RF15]: Already done
24	natural drain age patterns and loss of scenic character.
25	Action 1.4.a Use the town's zoning and subdivision regulations to control development in
26	areas characterized by shallow soils and/or steep slopes to reduce erosion and pollution
27	potential.
28	Action 1.4.b Review development on moderately steep slopes and prohibit development
29	on severely steep slopes.
30	Action 1.4.c Require the preparation and implementation of stormwater management
31	and erosion control plans for development on steep slopes.
I	

1	Action I.4.d Limit removal of woody vegetation on steep slopes.	
2	Objective 1.5 Protect the aquifers and groundwater that are the sources of Norwich's present and	
3	future drinking water supply.	
4	Action 1.5.a Identify and protect potential drinking water resources.	
5	Action I.5.b Identify and map all public water supplies and known aquifers in Norwich.	
6	Action I.5.c Re-evaluate the boundaries of the existing Aquifer Protection District.	
7	Action 1.5.d Regulate development to prevent contamination of public water supplies and	
8	known aquifers due to the on-site production, storage or disposal of potential pollutants	
9	or hazardous materials.	
10	Action 1.5.e Test groundwater in the Norwich village area to identify any pollution from	
11	s eptic systems.	
12	Action 1.5.f Develop contingency plans for supplying the Norwich village area with potable	
13	water in case of a disaster that contaminates the current drinking water supply.	
14	Action I.5.g Develop plans to add a filtration plant to the existing water system owned	
15	and controlled by the Norwich Fire District that serves the Norwich village area should	
16	treatment become necessary due to pollution of the groundwater stored in the aquifer.	
17	Objective I.6 Maintain and improve the water quality in the town's brooks and rivers.	
18	Action I.6.a Collaborate with neighboring Upper Valley communities in a regional effort to	
19	manage riverfront lands and improve the water quality of the Connecticut River.	
20	Action I.6.b Participate in state, regional, federal and other efforts to protect the	
21	Connecticut River.	
22	Action I.6.e Regulate development to prevent contamination of surface waters due to the	Comment [RF16]: No jurisdiction
23	on site production, storage or disposal of potential pollutants or hazardous materials.	
24	Action I.6.d Prohibit all discharges into rivers and brooks from failed septic systems,	Comment [RF17]: As above
25	construction site erosion, stormwater run-off, agricultural run-off and other sources of	
26	pollution that would adversely affect water quality.	
27	Action I.6.e Review development plans to assure adequate setbacks of buildings and	Comment [RF18]: Already done
28	septic systems to prevent erosion and pollution and minimize alteration of stream	
29	courses.	

1 2	<u>Action I.6.f</u> Encourage the maintenance or establishment of vegetated riparian buffers along the town's surface waters in order to filter stormwater runoff, prevent soil erosion	
3	protect wildlife and fish habitat and maintain water quality.	
4	Action I.6.g Promote the maintenance and planting of native woody plant species within	
5	riparian buffers by educating landowners about both appropriate native and	
6	inappropriate invasive trees and shrubs.	
7	Action I.6.h Limit-Discourage the maintenance or creation of expanses of lawn within	
8	riparian buffers in order to prevent erosion and maintain the natural condition and	
9	function of waterfront lands.	
10	Action I.6.i Educate the owners of waterfront properties about the potential impact of	
11	household chemicals, de-icers, animal waste, and lawn and garden products and	
12	practices on water quality.	
13	Objective 1.7 Protect public safety and private property from flood hazards by maintaining the	
14	natural functions of the town's floodplains and stream corridors.	
15	Action I.7.a Continue to participate in and meet the requirements of the National Flood	
16	Insurance Program so that owners within floodplains are eligible for flood insurance.	
17	Action 1.7 b Regulate development in order to prevent loss of life or property by	Comment [RF19]: Redundant see
18	prohibiting further significant development within identified floodways and floodplains.	
19	Action 1.7.c Review any proposed development, alteration of the natural grade or loss of	
19 20	<u>Action I.7.c</u> Review any proposed development, alteration of the natural grade or loss of pervious ground cover within identified floodways and floodplains in order to prevent	
19 20 21	<u>Action I.7.c</u> Review any proposed development, alteration of the natural grade or loss of pervious ground cover within identified floodways and floodplains in order to prevent restrictions to the flow of floodwaters or reductions in the natural ability of the land to	
19 20 21 22	<u>Action I.7.c</u> Review any proposed development, alteration of the natural grade or loss of pervious ground cover within identified floodways and floodplains in order to prevent restrictions to the flow of floodwaters or reductions in the natural ability of the land to absorb floodwaters.	
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19 20 21 22 23 24 25 26 27 28 29	Action 1.7.cReview any proposed development, alteration of the natural grade or loss of pervious ground cover within identified floodways and floodplains in order to prevent restrictions to the flow of floodwaters or reductions in the natural ability of the land to absorb floodwaters.Action 1.7.dComplete geomorphic assessments on the town's streams and implement measures to minimize loss of life or property due to fluvial erosion.Action 1.7.eExplore adoption of river corridor regulations to limit development in areas prone to fluvial erosion hazards.Action 1.7.fDo not locate any municipal or critical facilities, other than water-dependent structures, within mapped flood hazard or river corridor areas.Objective 1.8Preserve the functions and prevent the loss of the town's wetlands.	
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e above

1 2	Action I.8.c Petition the state to reclassify wetlands that the town considers of national importance to Class I status to ensure a higher level of protection.	Comment [RF20]: This is not explained ior defended in the text. Need to consider the implications
3 4	<u>Action I.8.d</u> Maintain <mark>provisions</mark> in Norwich's zoning and subdivision regulations to minimize the loss of wetlands to development.	Comment [RF21]: Wetlands are VT jurisdiction, we have buffer requirements
5	Action 1.8.e Educate landowners about the function and value of wetlands, including their	
6 7	role in storing water during storm events and reducing the severity of downstream	
, Q	Action L8 f Require construction of compensatory flood storage if wetlands that provide	Comment [DE22]: Son above
9	flood storage will be lost or adversely affected by proposed development so as to achieve	Comment [KF22]. See above
10	no net loss of the affected wetland's flood storage function.	
11 12	<u>Objective I.9</u> Conserve significant wildlife habitats, especially the habitats of rare and endangered species, protect core blocks of forest and maintain forest connectivity between blocks.	
13	Action I.9.a Define, identify, map and document Norwich's significant wildlife and plant	
14	habitats, including forest blocks and habitat connectors.	
15	Action I.9.b Map larger blocks of contiguous forest land and potential travel corridors	
16	between those blocks in Norwich and neighboring towns.	
17	Action 1.9.c Review subdivision and site plans to assess their effects on forest blocks,	Comment [RF23]: Already done
17 18 19	Action 1.9.c Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection.	Comment [RF23]: Already done
17 18 19	Action 1.9.6 Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection.	Comment [RF23]: Already done
17 18 19 20 21	Action 1.9.6 Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection. <u>Action 1.9.d</u> Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel	Comment [RF23]: Already done
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 17 18 19 20 21 22 23 24 25 	Action 1.9.c Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection. Action 1.9.d Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel corridors, deer wintering areas and natural areas to the greatest extent feasible. Action 1.9.e Require buffers between new development and significant wildlife habitats. Action 1.9.f Use the town's zoning and subdivision regulations to protect the habitats of rare and endangered species.	Comment [RF23]: Already done
 17 18 19 20 21 22 23 24 25 26 	Action I.9.c Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection. Action I.9.d Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel corridors, deer wintering areas and natural areas to the greatest extent feasible. Action I.9.e Require buffers between new development and significant wildlife habitats. Action I.9.f Use the town's zoning and subdivision regulations to protect the habitats of rare and endangered species. Action I.9.g Promote the protection of rare and endangered species, and their habitats,	Comment [RF23]: Already done
17 18 19 20 21 22 23 24 25 26 27	Action 1.9.c Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection. Action 1.9.d Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel corridors, deer wintering areas and natural areas to the greatest extent feasible. Action 1.9.f Use the town's zoning and subdivision regulations to protect the habitats of rare and endangered species. Action 1.9.g Promote the protection of rare and endangered species, and their habitats, by the town's landowners.	Comment [RF23]: Already done
 17 18 19 20 21 22 23 24 25 26 27 28 29 	Action 1.9.c Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection. Action 1.9.d Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel corridors, deer wintering areas and natural areas to the greatest extent feasible. Action 1.9.e Require buffers between new development and significant wildlife habitats. Action 1.9.f Use the town's zoning and subdivision regulations to protect the habitats of rare and endangered species. Action 1.9.g Promote the protection of rare and endangered species, and their habitats, by the town's landowners. Objective 1.10 Incourage the conservation of working forestlands and the use of management practices that enhance forest health and long term productivity.	Comment [RF23]: Already done Comment [RF24]: Forest practices are VT jurisdiction, ToN has no jurisdiction or resources. It is already demonstrably clear that Norwich property
 17 18 19 20 21 22 23 24 25 26 27 28 29 30 	Action 1.9.c. Review subdivision and site plans to assess their effects on forest blocks, habitat connectors and significant wildlife habitats in order to encourage their protection. Action 1.9.d. Require new development to be located and configured in a manner that minimizes adverse impacts on forest blocks and critical wildlife habitat, including travel corridors, deer wintering areas and natural areas to the greatest extent feasible. Action 1.9.e. Require buffers between new development and significant wildlife habitats. Action 1.9.f. Use the town's zoning and subdivision regulations to protect the habitats of rare and endangered species. Action 1.9.g. Promote the protection of rare and endangered species, and their habitats, by the town's landowners. Objective 1.10 Encourage the conservation of working forestlands and the use of management practices that enhance forest health and long term productivity. Action 1.10.a. Promote landowner participation in the state's current use program for	Comment [RF23]: Already done

1	Action 1.10.b Manage town forests and other forested public land in accordance with best	
2	practices in order to conserve and maintain them as a long term resource.	
3	Action I.10.c Require forestry practices that minimize erosion and damage to	
4	watercourses.	
E	Gool J	
5 6	dentify protect and preserve the important natural and historic features that create Norwich's scenic	
7	landscapes and community character.	
0		
8 9	Declive J.1 Protect the scenic beauty and fural character of Norwich's forests, open lands, shorelines and roads.	
10	Action 1.1.2 Identify and prioritize scenic areas and roads in town	Comment [DE25]: dono
10		
11	Action J.1.b Develop and implement plans to protect and encourage protection of identified econic cross and reads of highest priority.	
12	identified scenic areas and roads of nighest priority.	
13	Action J.1.c Require new development to be located and designed in a manner that	Comment [RF26]: done
14	minimizes its impacts on the town's identified scenic resources.	
15	Action J.1.d Designate development <mark>envelopes</mark> on lots being created or newly built upon	Comment [RF27]: done
16	where deemed necessary to ensure that buildings are sited to minimize impacts on	
17	identified scenic resources.	
18	Action J.1.e Encourage the use of construction materials and colors for new construction	Comment [RF28]: exceeds jurisdiction
19	in identified scenic areas that will result in structures blending into their surroundings.	
20	Action J.1.f Limit the scale and height of new structures to be built in identified scenic	Comment [RF29]: existing height limits, no
21	areas so that new development will better fit into its surroundings.	review. Recommend delete
22	Action J.1.g Require landscaping as needed to screen new development from view or	
23	blend it into the surrounding landscape.	
24	Objective J.2 Preserve Norwich's ridgelines in their natural state without visible intrusions by	
25	development as an integral component of the town's scenic character as viewed from public	
26	lands and roads.	
27	Action J.2. a Identify ridgelines and review proposed development on or adjacent to them	Comment [RF30]: done
28	in order to minimize impacts on the town's scenic character.	
29	Action J.2.b Limit clearing of existing vegetation on development sites.	Comment [RF31]: done
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1	Action J.2.c Limit the height and placement of new structures so that they remain below	Comment [RF32]: done
2	nearby ridgelines and the forest canopy.	
3	Action J.2.d Require landscaping as needed to screen new development or blend it into	Comment [RF33]: done
4	the surrounding landscape.	
5	Action J. <mark>2</mark> .e Require the use of construction materials and colors that will enable	Comment [RF34]: exceeds curren authority
6	structures to blend into their surroundings.	
7	Objective J.3 Preserve existing open space as a vital component of Norwich's rural character.	
8	Action J.3.a Encourage landowners to keep their fields open and educate them about	
9	mowing practices that will not harm nesting birds.	
10	Action J.3.b Identify and evaluate significant open space areas in Norwich that may	
11	warrant special protection.	
12	Action J.3.c Develop and implement a plan to protect and encourage protection of open	
13	space of high priority utilizing landowner cooperation and by purchase, using the town's	
14	Conservation Trust Fund and other private and public resources.	
15	Action J.3.d Use Norwich's zoning and subdivision regulations to promote cluster/open	Comment [RF35]: done
16	space development, so as to maintain a significant amount of open space.	
17	Action J.3.e Require that subdivision and site plans respond to the existing landscape	
18	features and patterns that are components of rural character such as hedgerows, stone	
19	walls, open fields and the <mark>terrain</mark> .	Comment [RF36]: Some of these features are addressed, this would require design review. Suggest delete
20	Objective J.4 Protect Norwich's residents from the intrusion of noise, light, traffic and similar	Comment [RF37]: What is the risk? Air travel
21	impacts at levels not characteristic of a rural environment.	and state highway traffic outside ToN jurisdiction
22	Action J.4.a Regulate sources of loud or persistent noise such as aircraft overflights, vehicles that	Formatted: Indent: Left: 0.5"
23	have removed exhaust noise suppression devices for greater power, vehicles and equipment with	
24	back-up alarms, and similar sources.	
25	Action J.4.b Establish and enforce daytime and nighttime noise levels that preserve the quality of	
26	life enjoyed and expected by town residents.	
27	Action J.4.c Regulate lighting, so that it may be reasonable for public safety, but ensure access to	
28	the day and night sky by minimizing intrusive light.	
29	Action J.4.d Revise zoning and subdivision regulations to protect the environment from un-	
30	necessary, offensive and wasteful lighting, while providing such lighting as is reasonably	
31	necessary for public safety, and to ensure reasonable access to natural light and darkness.	

1	Action J.4.e Revise zoning and subdivision regulations to require new development projects to	Formatted: Indent: Left: 0.5", Space After: 6
2	show that lighting and construction will not impede access to natural light and darkness for	pt
3	neighboring units.	
4	Objective J.5 Enhance public access to Norwich's rivers, streams and natural areas via an	
5	interconnected greenway system.	
6	Action J.5.a Identify and map existing trails and greenways.	Comment [RF38]: done
7	Action J.5.b Identify existing trails and Class 4 roads, and interconnect as possible and	Comment [RF39]: done
8	maintain them for public use.	
9	Action 1.5.c Identify and map "unidentified corridors" as defined in the state's Ancient	Comment [RF40]: done
10	Roads statute, and re classify those that can be delineated to town highways or trails as	
11	appropriate based on the long term interests of town residents.	
12	Action J.5.d Identify potential trail corridors to link existing trails and greenways with	
13	each other and with trail systems in neighboring towns.	
14	Action J.5.e Create public trails to access natural and scenic resource areas where	
15	feasible and appropriate.	
16	Action J.5.f Schedule regular maintenance of town trails by Conservation	
17	Commission/Trails Committee.	
18	Objective J.6 Protect Norwich's archaeological, historic and cultural resources in order to	
19	preserve the community's history, heritage, culture and character for future generations.	
20	Action J.6.a Establish criteria for identifying sites with potential archaeological value in	Comment [RF41]: VT jurisdiction
21	Norwich.	
22	Action J.6.b Require professional assessments of the potential of new development to	Comment [RF42]: No authority
23	impact archaeological resources when development is proposed on sites identified as	
24	archaeologyically sensitive.	
25	Action J.6.c Designate development envelopes on lots being created or newly built upon,	Comment [RF43]: done
26	where deemed necessary, to ensure that buildings are sited to minimize their impacts on	
27	archaeological resources.	
28	Action J.6.d Support work conducted by the Norwich Historical Society.	
29	Action J.6.e Establish criteria for identifying significant historical structures or sites in	
30	Norwich.	

1	Action J.6.f Identify, designate, map and document Norwich's significant historic sites or	
2	structures to encourage greater public recognition, enjoyment and protection of these	
3	resources.	Comment [RF44]: done
4	Action J.6.g Identify any historic structures outside the town's designated historic district	
5	or not included in the state's inventory of historic resources.	Comment [RF45]: done
6	Action 1.6 b Seek designation on the National Register of Historic Places for other	
7	Norwich historic clusters like Beaver Meadow and Union Village	
,		
8	Action J.6.i Allow for the adaptive reuse, restoration or reconstruction of historic	
9	structures that may otherwise not conform to zoning standards such as setbacks and	
10	height <mark>limits</mark> .	Comment [RF46]: done
11	Action J.6.j Review development plans prior to construction or demolition to prevent or	
12	minimize any adverse effects on significant historical sites or structures.	Comment [RF47]: no jurisdiction
13	Action J.6.k Document details of structures slated for remodeling or demolition with	
14	photographs and reports.	
1 -	Action LCL Dequire that subdivision and site plans respond to and incorporate systems	
15	Action J.b.1 Require that subdivision and site plans respond to and incorporate existing	
10	nistorio structures and landscape leatures that speak to the town's heritage, culture and	
10	character, such as cental holes, scone wans and historic bundings including barris and	
10	agricultul al out <mark>pullulings</mark> .	Comment [Kr40]: no junsaiction
19	<u>Action J.6.m</u> Require that new development be designed to maintain the historic context	
20	of the site and its environs, and to minimize its impact on historic value, architectural	
21	integrity and views of identified historic structures hearby <mark>.</mark>	Comment [RF49]: loosely done now
22	Objective J.7 Encourage and support the retrofitting of older buildings as a more energy efficient	
23	and sustainable practice than demolition and rebuilding.	
24	Action 1.7.2 Consider the total cost of energy use and sustainability when determining	Comment [RE50]: no jurisdiction
24 25	whether to retrofit an older building or demolich it and re-build. Energy costs may	
25	include demolition, disposing of the used materials, manufacturing and transporting new	
20	metale demondor, asposing of the ased materials, manufacturing and transporting new	
28	materials, and construct the original building - may also be considered and include the	
29	energy used to create the materials and construct the original building.	
30	Action 1.7.b Provide information to owners of older and historic buildings about the many	
31	tax credits, grants, and low interest loans created to support both historic preservation	
32	and energy efficiency	