

COGINCHAUG RIVER WATERSHED BASED PLAN GUIDED SUMMARY 2011



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TABLE OF CONTENTS

	<u>Page Number</u>
1.0 Introduction	1
2.0 Executive Summary	1
3.0 Description of the Coginchaug Watershed	2
4.0 Water Quality Issues in the Watershed	2
5.0 Land Use and Land Cover	3
6.0 What Needs to be Done to Improve Water Quality?	4
6.1 Watershed Wide BMP Recommendation	4
6.2 Analysis Area Place-Based Recommendations	6
7.0 Goals and Objectives	13
8.0 Where Are We Now?	16

Tables

Table 1. Watershed Land Use/Land Cover Summary	3
Table 2. Goals and Objectives	13

Attachments

Figure 1. Map 1: Coginchaug River Watershed	
Figure 2. Map 3: Analysis Areas and Water Quality Monitoring Points	
Figure 3. Map 4: Broad Land Use/Land Cover Classification	
Appendix A. Coginchaug River Watershed Based Plan Implementation Committee Members	

1.0 INTRODUCTION

This Guided Summary of the Coginchaug Watershed Based Plan was produced for town officials, business owners, homeowners, and the general public to provide a condensed summary of the full plan focused on recommended improvement actions. A large portion of the wording, tables, and maps are taken directly from the original plan, with editing as appropriate. To allow the reader to refer back to the plan to obtain more detailed information, references to the original plans are included throughout the summary. This summary will highlight the findings of the full report and enhance the ability of local stakeholders to implement management practices to improve water quality.

The full version of the watershed based plan, entitled *Coginchaug River Watershed Based Plan*, was produced in July 2008 by USDA–Natural Resources Conservation Service with two primary goals. The first was to provide a clear plan to address the pollutants of concern in the Coginchaug River. The second goal was to develop an effective and replicable watershed assessment model that can be used by municipalities, non-profits and other agencies. For copies of the full plan, additional information on the plan, or the watershed based planning process, please contact:

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The plan can also be found on the Department of Environmental Protection website:
http://ct.gov/dep/lib/dep/water/watershed_management/wm_plans/coginchaug/cog_planweb.pdf

2.0 EXECUTIVE SUMMARY

The Coginchaug River watershed is roughly 39 square miles in size and covers seven towns. Located in the central lowlands of Connecticut, the Coginchaug River main stem is approximately 15 miles long and flows northward until it meets with the Mattabasset River. In 2004, the State included the Coginchaug River in its final 303(d) Impaired Waterbody Listings. Bacterium was cited as the principal water quality concern to be treated with Best Management Practices, with nitrogen inputs from stormwater as a secondary targeted pollutant. Best Management Practices (BMPs) are effective, practical, structural or nonstructural methods that prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or which otherwise protect water quality

The full Coginchaug Watershed Based Plan (Coginchaug WBP) makes recommendations on two levels: BMPs suitable for implementation throughout the watershed, and BMPs for particular sites within the watershed, identified in the report as “place-based”. The “place-based” sites are considered potentially significant sources of pollutant loading. The WBP provides estimates of the technical and financial resources needed to implement recommended practices.

3.0 DESCRIPTION OF THE COGINCHAUG WATERSHED

A watershed is a geographic area where all precipitation falling in that area drains to a single point, in this case the Coginchaug River. The Coginchaug River watershed is approximately 39 square miles in size (24,927.6 acres) and includes portions of eight towns: 48.7 percent of the watershed is in Durham, 28.5 percent in Middlefield, 12.9 percent in Middletown, 6.7 percent in Guilford, 1.6 percent in Madison and the remainder in the towns of Meriden, Wallingford and North Branford. The watershed also includes the local basins of Allyn Brook and Sawmill Brook. These, along with the Coginchaug River, are part of the Mattabasset River Regional Basin. The Mattabasset is within the Connecticut River Major Basin. (See **Figure 1**. Map 1: Coginchaug River Watershed, excerpted from the full Coginchaug WBP).

Unlike most rivers in Connecticut, the Coginchaug River flows in a northerly direction. The headwaters are located in the Town of Guilford, at Myer Huber Pond. The upper reaches of the watershed are less densely developed, with the watershed becoming progressively more developed as one travels downstream. The Coginchaug River flows into the Mattabasset River at the North End Peninsula in Middletown, CT. The area of confluence, known as Boggy Meadows, contains a diverse, healthy and unique ecosystem.

For additional information, please refer to the section Watershed Description on page 13 of the full Coginchaug River Watershed Based Plan.

4.0 WATER QUALITY ISSUES IN THE WATERSHED

The Connecticut Department of Environmental Protection (CT DEP) had targeted the Mattabasset and Coginchaug Rivers for improved nonpoint source (NPS) pollution management due to problems associated with land development, agricultural and urban runoff, and limited streamside vegetative buffers. Unlike point source pollution, which originates from a specific discharge point, nonpoint source pollution comes from many diffuse sources that are difficult to pinpoint. NPS pollution is caused by runoff moving over and through the ground where it picks up and carries natural and man-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and ground waters.

Water quality monitoring activities were undertaken by the Connecticut River Coastal Conservation District's Connecticut River Watch Program (CRWP) in collaboration with the CT DEP to learn more about the river's health. Monitoring activities have documented high levels of bacteria and nutrients from chronic sources and stormwater runoff, and high turbidity associated with storm events. Use of the river for contact recreation is considered impaired by the DEP due to high levels of indicator bacteria. The Coginchaug River is on the state's impaired waters list, and in 2005, the CT DEP established a *Total Maximum Daily Load (TMDL) for the Mattabasset River Regional Basin*, including the Coginchaug River, for the indicator bacteria *Escherichia coli* (*E. coli*).

For additional information, please refer to the Watershed Description section on page 13 of the full Coginchaug River Watershed Based Plan.

5.0 LAND-USE AND LAND COVER

The primary objective of the Land Use/Land Cover (LULC) data set is to provide a picture of the Coginchaug watershed landscape. With this in mind, the Natural Resources Conservation Service (NRCS) LULC classification scheme is designed to separate out classes of land cover by their potential impacts on levels of pollutants (specifically bacteria and nitrogen) entering into surface water or ground water and organize them based on four Analysis Areas (AA). (See **Figure 2**, Map 3: Analysis Areas and Water Quality Monitoring Points, excerpted from the full Coginchaug WBP). Using 2005 aerial photo imagery, a total of 34 classes of land use and land cover were established. Creating such a detailed, large-scale land use/land cover map sets up a foundation for understanding the relationship between landscape patterns and water quality conditions. (See **Figure 3**, Map 4: Broad Land Use/Land Cover Classification; and **Table 1**: Watershed Land Use/Land Cover Classification, below).

The LULC findings support the general perception of the Coginchaug River watershed as a complex landscape with a mix of land uses. As can be seen from the totals in Table 1, forested watershed comprises nearly fifty percent of the watershed, while slightly less than one-third of the watershed is classified as developed, and a little less than fourteen percent is in agriculture. The majority of this agricultural land is located along the main stem of the Coginchaug River or along its major tributaries.

Table 1: Watershed Land Use/Land Cover Summary

Analysis Area	Data	Forest	Developed	Agriculture	Other	Transitional	Water	Barren	Grand Total
1	Acres of Cover	1,661.50	1,838.55	394.54	171.37	110.63	123.44	1.68	4,301.71
	% of Analysis Area	38.62%	42.74%	9.17%	3.98%	2.57%	2.87%	0.04%	100.00%
2	Acres of Cover	1,565.64	1,773.67	917.16	239.07	111.29	131.86	0	4,738.69
	% of Analysis Area	33.04%	37.43%	19.35%	5.05%	2.35%	2.78%	0.00%	100.00%
3	Acres of Cover	6,578.65	3,710.28	1,783.44	481.02	333.78	42.60	121.83	13,051.60
	% of Analysis Area	50.40%	28.43%	13.66%	3.69%	2.56%	0.33%	0.93%	100.00%
4	Acres of Cover	2,019.62	409.00	351.67	5.29	12.37	25.18	12.50	2,835.63
	% of Analysis Area	71.22%	14.42%	12.40%	0.19%	0.44%	0.89%	0.44%	100.00%
Total Acres in Coginchaug Watershed		11,825.42	7,731.49	3,446.81	896.75	568.07	323.08	136.02	24,927.63
Total % of the Coginchaug Watershed		47.44%	31.02%	13.83%	3.60%	2.28%	1.30%	0.55%	100.00%

For additional information, please refer to the Methodology – Land Use/Land Cover GIS Data Set section on page 27 of the full Coginchaug River Watershed Based Plan.

6.0 WHAT NEEDS TO BE DONE TO IMPROVE WATER QUALITY?

Based on the information gathered during development of the full plan, recommendations were developed to address water quality issues on both a watershed wide basis and for specific locations.

6.1 Watershed Wide BMPs

- **Vacuum-assisted Street Sweeping:** Regular street sweeping is recommended to reduce the potential loading of sediment and debris into waterbodies, as well as any associated pollutants that may be absorbed or adsorbed by the sediments. Because cost and availability of equipment may be limiting factors, particular areas within the watershed determined to have a higher risk of pollutant loading could be targeted for more frequent sweeping. All streets in the basin should be swept at least twice a year.
- **Regular maintenance of Catch Basins:** Stormwater enters storm sewer systems via catch basins. Without regular maintenance, water flowing into a catch basin may flush trapped sediment and associated pollutants into the receiving waters. The benefits associated with improved pollutant removal needs to be weighed against the increased cost of maintenance.
- **Catch Basin Filters:** Catch basin inserts are devices installed in existing catch basins under the storm grate to treat stormwater through filtration, settling or absorption. They require regular cleaning and replacement of filters for maximum removal efficiency. While included in the original 2008 Coginchaug Watershed Based Plan, recent field observations indicate a high rate of clogging, so they should only be used if frequent and thorough maintenance is anticipated. The high initial capital cost and intensive maintenance should be considered when comparing catch basin filters against other stormwater retrofits.
- **Stormwater Retrofits:** Though not included in the original watershed based plan, other structural stormwater BMPs, Low Impact Development management measures, and reductions in impervious cover should also be encouraged to reduce the impacts of stormwater runoff. Examples include constructed ponds and wetlands, bioretention systems, infiltration structures and sand filters. (See the Department of Environmental Protection 2004 *Connecticut Stormwater Quality Manual* for more information)
- **Agricultural Nutrient Management Plans (for all agricultural operations, including horse farms):** Numerous livestock agricultural operations exist in the Coginchaug River watershed. Livestock waste contains dissolved nutrients (especially nitrogen, phosphorous and potassium), organic matter, solids, bacteria (including fecal coliform and other indicator bacteria). Without appropriate measures, stormwater runoff and leaching can transport livestock waste and pollutants into wetlands, watercourses, waterbodies and associated groundwater, resulting in a significant risk of pollutant loading. Comprehensive nutrient management plans (CNMPs) should be developed for agricultural livestock operations of all sizes. Measures may include waste collection, handling, storage, treatment and transfer facilities, evaluation and treatment of sites proposed for land application of waste, land application methods, record keeping activities, and companion practices such as livestock exclusion along streams to restrict access, establishment of streamside buffers to trap sediment and implementation of prescribed grazing systems. Costs of these practices will depend on the size of the operation and number of animals, which influence the sizing of structural measures.

- **Educational Materials for Agricultural Operations:** Education and outreach geared for agricultural producers would enhance their understanding of the relationship between farm practices, management plans, and water quality. Information would include practices that could be implemented to improve control of stormwater runoff, protection of watercourses, pasture management and waste management. Cost for education and outreach efforts will depend on the exact nature of the materials being produced (e.g. flyers, brochures, booklets, workshops, etc.), and the numbers being produced.
- **Educational Materials for Residents, Businesses, Commissions and Other Stakeholders:** Outreach and education programs and materials will increase general understanding of water resources and water quality concerns, and provide methods to positively impact water quality. Information can be geared specifically towards the appropriate stakeholders, such as general information for residents and businesses, and more of a more technical approach for Commissions and municipalities. Cost for education and outreach efforts will depend on the exact nature of the materials being produced (e.g. flyers, brochures, booklets, workshops, etc.), and the numbers being produced. Topics could include the value of wetlands and watercourses; benefits of vegetated buffers and how to create them; organic and sustainable land care practices; importance of pet waste pick-up; need for septic system inspection and maintenance; proper disposal of yard waste, trash and debris, and hazardous household products; Low Impact Development practices.
- **Subsurface Sewage Disposal System Maintenance and Repair:** Failing private septic systems may contribute to pollutant loading. Watershed residents with private systems should be made aware of the potential problems associated with failing systems and should be encouraged to maintain their systems regularly and repair them when necessary. Costs for maintenance and repair may vary depending on the size of the system, the type of maintenance being done, or the type of repair necessary.
- **Vegetated Buffers along Streams:** Vegetation along a watercourse or waterbody provides numerous benefits. Vegetated buffers help decrease pollutant loading by slowing sediment transport and through nutrient uptake and storage. In addition, vegetated buffers create a visual barrier for geese and have been found to be effective in discouraging the birds from using a waterbody. Given that a typical goose dropping has approximately 130,000 colony-forming units of fecal coliform, keeping geese from the water through use of buffers may decrease fecal coliform loading significantly. Costs will vary depending on the specific plants selected, the degree of site preparation required and the density of planting.
- **Municipal Regulations:** Municipalities can use their regulations to more effectively manage adverse water quality impacts that may arise as a result of growth and land planning decisions. At a minimum, stormwater management regulations can be used to strongly encourage or require measures or practices that address water quality and/or water quantity issues. Site specific investigations should be conducted to ensure that appropriate land planning techniques are implemented. Additionally, regulations should encourage Low Impact Development (LID) practices. The cost of a regulatory review would be associated with the time required to review and modify regulations.

For additional information, please refer to the Watershed Wide BMP Recommendations section on page 95 of the full Coginchaug River Watershed Based Plan.

6.2 Place-Based Recommendations for Analysis Areas

Place-based recommendations focus attention on impacts that individual sites may have on water quality and methods to prevent these impacts. The individual sites listed below represent locations with a high potential for bacterial loading. In order to assess the actual contribution of any of these sites, detailed site specific analyses are required. Analysis areas are based on DEP monitoring sites and are grouped based on LULC. A map detailing the locations of the Analysis Areas can be found in **Figure 2**, Map 3: Analysis Areas and Water Quality Monitoring Points. Any updates on the current status of recommendations are indicated in bold.

Analysis Area 1(AA-1)—Middletown/Middlefield

1. Buffer Implementation Sites: 51 segments of unbuffered stream were identified, each at least 75 feet in length.
2. Soil Potential for Subsurface Sewage Disposal Systems: The areas identified with medium to extremely low suitability for septic systems should be considered as priorities for investigation to confirm that no septic failures or illicit discharges are taking place. Analysis Area 1 contained 8.8 acres mapped as medium to extremely low potential for septic.
3. Sewer Line under Coginchaug River, Middletown: The sewage line runs under the river at two points where it is encased in cement. Based on this information, it was determined that any bacterial loading from the sewer line was highly unlikely. Since publication of the original plan, the City of Middletown has uncovered concerns about potential stormwater infiltration and release of combined stormwater and sewage into the river through manholes. Suggested solutions to this potential problem include the installation of manholes with watertight frames and covers. Additional investigation should be conducted.
4. Veteran's Park Snow Pile, Middletown (subwatershed AA-1.B): Options to address potential issues associated with runoff from the snow pile include installing filters in each of the catch basins, finding an alternate location for the snow pile, and treating stormwater runoff by installing a structural BMP such as a stormwater pond, wetland or filtration system.
5. Laurel Brook Reservoir¹, Middlefield/Middletown: This public drinking water supply reservoir for Middletown is located primarily in Middlefield. Though the majority of land in the vicinity is forested, several pockets of land with a high runoff potential rating are located in relatively close proximity to the reservoir. A more thorough investigation of those areas should be conducted.
6. Ross Road Small Agricultural Operation, Middlefield: Four to five head of cattle were observed along with several types of domesticated birds. At the time of the streamwalk assessment, no fencing was present and the livestock had access to the stream. Exclusionary fencing and establishment of a riparian vegetated buffer would provide protection for the stream and decrease the probability of pollutant loading. A stock watering system should be installed away from the stream.

¹ Laurel Brook was the subject of an intensive stream corridor assessment conducted by the Connecticut River Coastal Conservation District in 2009. For more information or a copy of the *Laurel Brook Track Down Survey and Water Quality Monitoring Report* completed in December 2009, contact the District at (860) 346-3282 or ctrivercoastal@conservect.org.

7. Wadsworth Falls State Park, Middletown/Middlefield²: Water quality testing in the pond has revealed elevated and unsafe levels of *E. coli* bacteria, resulting in closure of the Park's pond on numerous occasions. Sources could include human waste as well as that of wildlife, such as geese, deer, raccoons and other animals. Further, because water is pumped from the river to replenish the pond, high bacteria levels in the river could also be contaminating the pond.
 - a. Install an ultraviolet light system in the pond's discharge pipe to disinfect water before it is released back into the Coginchaug River.
 - b. Design and construct a wetland or other stormwater BMP that would serve to filter the pond water before it reenters the Coginchaug River.
 - c. Additional water quality testing of the River just upstream of the pumping station and series of dry wells to verify the source of the bacteria.
 - d. The 225 to 250 foot reach of Laurel Brook extending upstream from the confluence with the Coginchaug River lacks riparian vegetation and is channelized, and is showing signs of bank erosion. Establish a twenty foot riparian buffer on either side of the stream.
 - e. As pet waste contains high levels of bacteria, place pet waste collection systems on trails or sections of trail strategically to increase the chance that pet owners will dispose of pet waste properly. **(This recommendation was already implemented by the Conservation District.)**
 - f. The CT DEP should assess the septic management system for the public restroom facilities located at the Park's main entrance to confirm that it is functioning properly and no illicit discharges are occurring.
 - g. A number of picnicking areas with grilling facilities are located around the main entrance to the park and in close proximity to the swimming pond. Food waste should be discarded in secure containers, and eliminated from the site promptly. The public and park users should be educated about water quality concerns resulting from leaving food waste, which attracts wildlife.
8. Commercial Districts – Route 66, Middletown
 - a. Increase street sweeping at large impervious parking lots, such as the Home Depot/Price Chopper and the Staples/(former) A & P parking lots. Also, work should be done with business owners to ensure that food waste is dealt with properly.
 - b. Maintain the catch basins in the area. A regular maintenance schedule of would decrease the potential for re-suspension of sediments.

² Wadsworth Falls State Park is included in the *Laurel Brook Track Down Survey and Water Quality Monitoring Report* mentioned in footnote 1.

Analysis Area 2 (AA-2) – Middlefield

1. Buffer Implementation Sites: There are 50 segments of unbuffered stream, each at least 75 feet in length.
2. Soil Potential for Subsurface Sewage Disposal Systems: Areas identified with medium to extremely low suitability for septic systems should be considered as priorities to investigate and confirm that no septic failures or illicit discharges are taking place. Analysis Area 2 contained 77.2 acres mapped as medium to extremely low potential for septic.
3. Ellen Doyle Brook/Lake Beseck, Middlefield: Additional water quality testing at the lake outlet is recommended to determine whether bacteria levels are elevated in the lake. If elevated levels are found, more detailed analysis would be required to determine the specific source of the pollutant loading.
4. Lake Beseck Properties, Middlefield: Stormwater runoff from residential areas transports pollutants generated from automobile use and maintenance, fertilizer and herbicide applications or pet waste left on the ground.
 - a. Low Impact Development (LID) practices should be implemented to promote infiltration and reduce storm water runoff, including:
 - i. Permeable paving material for driveways. These materials permit infiltration of precipitation thereby reducing runoff.
 - ii. Rain gardens. Stormwater is directed to appropriately-sized landscaped gardens planted with vegetation that can withstand wet conditions, including periodic standing water.
 - iii. Lawn alternatives. Replant lawns with vegetation other than turf grass.
 - b. Installation of catch basin inserts at strategic locations. At a minimum, inserts should be installed in the catch basins that are the final stop before water is discharged into the lake.
 - c. Additional water quality testing at selected sites around the lake would help locate sources of lake pollutants.
5. Triangle A Farm, Middlefield (subwatershed AA-2.C): The farm is situated at the headwaters of Hans Brook, a tributary to the Coginchaug River. Data from the site indicates that elevated levels of bacteria are present.
 - a. Though the pond does not discharge directly into the Coginchaug River or one of its tributaries, it does drain into a wetland that feeds Hans Brook. Potential pollutant loading could be reduced by establishing a vegetated buffer around the unvegetated portion of the pond and by installing fencing to prevent livestock from having direct access to the pond.
 - b. With assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management should be developed. **(A waste/nutrient management project is in process with NRCS; also, the Conservation District is conducting a multi-year nutrient management project in collaboration with UConn to determine optimum amounts of fertilizer to apply to silage cornfields.)**
6. Residential properties, Middlefield: There are two properties, located on the west side of Jackson Hill and the eastern side of Triangle A Farm, in an area with a combination of soils mapped as having high potential and low potential for septic suitability. The septic

systems at these properties should be inspected by the Town Sanitarian to confirm that they are functioning properly.

7. Cahill Environmental Services, Middlefield: Located adjacent to the Coginchaug River and Hans Brook, this company provides a portable toilet rental service, among others. The toilet units are stored on the property adjacent to the river. The existing riparian buffer is of minimal width. Cahill expressed an interest in working with the local Conservation District to maintain and enhance the existing riparian buffer between the Coginchaug River and the storage area. Doing so will minimize any potential leaks or accidental spill of waste into the river. **(Conservation District staff met with Cahill and made recommendations for buffer enhancement in 2009).**
8. Lyman Orchards, Middlefield: Excluding the ponds and stream flowing through the golf course, there are three ponds and one stream associated with the property that are potentially affected by pollutant loading: the irrigation pond located in the orchards on the north side of South Street; a small pond on the east side of Route 157 roughly 0.10 miles south of the intersection of Routes 157 and 147; and the pond located in front of the Lyman Orchards Apple Barrel store.
 - a. Option 1: Establish a vegetated buffer around the irrigation pond and the Apple Barrel Store pond, and eliminate the waterfowl from the area. A supplemental practice would be to establish a buffer around the orchard pond. This pond feeds into the brook and waterfowl have been observed at the pond.
 - b. Option 2: The small pond on the east side of Route 157 outlets into the Apple Barrel Store pond. One or two structural BMP filtration systems could be installed, in combination with vegetated buffers, to treat the discharge from the Apple Barrel Store pond.
 - c. Option 3: Install five or six structural filtration systems for the larger pond if no additional treatment methods are implemented for the other areas/waterbodies around the store.
 - d. Option 4: Install a filtration unit in the existing outlet pipe from the large pond so that pollutants would be treated prior to discharge into Lyman Meadow Brook.
 - e. Option 5: Construct an appropriately designed wetland on the north side of 147 to treat the water from the pond and the stream. Based on preliminary analysis, considering watershed size and estimated flows, such a system would require a large amount of the land area currently in production.
 - f. Supplemental Practice: Incorporate low impact development practices in the parking areas around the store. These may include permeable pavement, catch basin filters, vegetated buffers/swales off of the parking area, bioretention systems to treat stormwater runoff.

Analysis Area 3 (AA-3) – Durham

1. Buffer implementation sites: 141 segments of unbuffered stream were identified, constituting a total of 60,208 linear feet.
2. Soil potential for subsurface sewage disposal systems: The areas identified with medium to extremely low suitability for septic systems should be considered as priorities to investigate and confirm that no septic failures or illicit discharges are taking place. Analysis Area 3 contained 105 acres mapped as medium to extremely low potential for septic.
3. White's Farm, Durham (Dog Waste) (subwatershed AA-3.D, AA-3.G): White's Farm is a town-owned open space parcel, 94 acres in size, used for passive recreation including dog walking. Implementing a dog waste collection program would help decrease the potential for dog waste entering the brook. Ideally, multiple collection stations would be set up around the property, facilitating waste disposal for dog owners and increasing effectiveness. At least one collection site should be in close proximity to Allyn Brook; this area is used heavily by dog walkers and is most prone to pollutant loading. **(Plans are underway by the town of Durham for a pet waste collection project here).**
4. Equine Operations: Five horse farms are located in this analysis area and, with assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management plans should be developed for each.
5. Deerfield Farm, Durham: This farm, located on Parmelee Hill Road in Durham, produces raw milk from Jersey cows along with milk-based skin care products. Though the farm does not abut any watercourse, a comprehensive farm plan is recommended to address the water quality concerns associated with dairy operations.
6. Greenbacker Farm, Durham: Greenbacker Farm is a dairy operation located in Durham. The farm ponds off of Route 68 are subject to stormwater runoff and contamination from farm livestock and wildlife. Recommendations include:
 - a. Goose control through a variety of possible techniques (egg addling, harassment with dogs, fencing, vegetated buffer). While studies have shown that grass and herbaceous buffers are effective on their own, the inclusion of some trees and shrubs may further deter geese from landing in a pond. A minimum buffer width of 15 feet is recommended, although a buffer 30-50' would be preferred because of the surrounding slopes and the amount of pollutant loading.
 - b. Fencing in conjunction with a buffer of trees and shrubs to keep livestock out of pond. Installation of a livestock watering system, well away from the ponds and wetlands, should be part of this option.
 - c. Conversion of the existing pond, on the north side of Route 68, into a vegetated wetland complex along with installation of a watering system for the livestock.
 - d. With assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management, should be developed. **(The Conservation District is currently conducting a nutrient management project in collaboration with UConn to determine optimum amounts of fertilizer to apply to silage cornfields.)**

Analysis Area 4 (AA-4) – Durham/Guilford

1. Buffer implementation sites: Forty three segments of unbuffered stream were identified, constituting a total of 19,891 linear feet.
2. Soil potential for subsurface disposal systems: The areas identified with medium to extremely low suitability for septic systems should be considered as priorities to investigate and confirm that no septic failures or illicit discharges are taking place. Analysis Area 4 contained 24 acres mapped as medium to extremely low potential for septic.
3. Myer Huber Pond, Guilford: Myer Huber Pond is located at the headwaters of the Coginchaug River. Elevated levels of bacteria have been measured near this location, as evidenced by the data from the ancillary CRWP monitoring station C0R070 located at Bluff Head Road, just downstream from the pond. The source of bacteria remains undetermined.
 - a. Water quality testing at the pond outlet is recommended to determine whether the bacteria originate in the pond or enter the watercourse from a source downstream of the pond. If elevated bacteria levels are present in the pond, possible sources may include wildlife, such as transient geese or resident beavers.
 - b. The adjacent residential septic systems should be dye-tested and monitored to ensure that no failures are occurring.
4. Bluff Head Horse Farm, Guilford: With assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management should be developed. It should be noted that from aerial imagery it appears that there is some sort of channel or path connecting the area of the farm to the north end of Myer Huber Pond. Further assessment should be conducted to determine whether any farm runoff is being conveyed to the pond along this pathway. If so, appropriate measures should be taken to direct or prevent such flows.
5. Wimler Farm, Durham: Wimler Farm is a former dairy operation, which was active at the time the Watershed Based Plan was developed. Additional investigation should be conducted to determine which of the following recommendations are still appropriate.
 - a. With assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management should be developed.
 - b. Without conducting a detailed assessment of the property, recommendations for the site based on observations include the establishment of exclusionary fencing along the Coginchaug River. A watering facility for the livestock should be installed away from the river.
 - c. Establishment of a streamside vegetated buffer, ideally a minimum of 35 feet. The buffer should extend for the full length of the portion river that abuts the farm. Vegetation should consist of at least 50% tree and shrubs with the remaining 50% in grasses and herbaceous cover.
 - d. A parcel of land at the corner of Crooked Hill Road and Route 77 (Guilford Road) is currently used for pasturing livestock. A tributary to the Coginchaug River runs through this parcel. Significant algae were observed in the stream. Purchase of the parcel would be the most effective means for eliminating potential pollutant loading from livestock. Buffering of the stream could be conducted after purchase or the property could be left to revegetate naturally.

6. Small agricultural operations, Guilford:
 - a. Several sheep are penned and kept on a residential property located adjacent to Myer Huber Pond. The home is located on the west side of Route 77. With assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management should be developed.
 - b. A small chicken farm operation is located on the east side of Route 77 just north of Myer Huber Pond. With assistance from appropriate agencies, a comprehensive conservation plan, including pasture management, nutrient management and waste management should be developed.

For additional information, please refer to the Analysis Area Place-Based Recommendations section on page 110 of the full Coginchaug River Watershed Based Plan.

7.0 GOALS AND OBJECTIVES

In conjunction with compilation of data and the development of recommended BMPs, the full plan also includes goals and objectives for implementation.

Table 2: Goals and Objectives

Goal	Improved water quality of the Coginchaug River watershed through reduced bacterial contamination and degradation from other nonpoint source pollutants, including nitrogen.
Objective 1	Identify potential sources of funding (1 year)
Actions/Milestones	<p>Research funding organizations</p> <p>Incorporate funding source information into the WBP</p> <p>Grant application submitted for specific project</p>
BMPs	N/A
Objective 2	Work with the agricultural community to enhance understanding of land stewardship and use of BMPs to protect water quality.
Actions/Milestones	<p>Gather existing educational information for agricultural management, and develop new agricultural management educational materials as needed.</p> <p>Create new materials (includes both general information as well as information specific to particular types of agriculture [horse farming, greenhouse operations, etc...]).</p> <p>Distribute written materials to agricultural operators in the watershed.</p> <p>Provide materials explaining State (CT DOA, CT DEP) and Federal (USDA) programs.</p> <p>Advertise the Horse Educations and Awareness Program (HEAP) and work to involve horse farm operation in HEAP.</p> <p>Conduct workshops dependent upon interest and need.</p> <p>Obtain funding to produce and distribute materials and to conduct workshops.</p> <p>Educational materials and workshops.</p>
BMPs	N/A
Objective 3	Build awareness of nonpoint source management practices and reduce nonpoint source contributions from residential and business areas through development and distribution of educational materials.
Actions/Milestones	<p>Collect existing educational materials.</p> <p>Develop new and/or revise existing materials as needed.</p> <p>Distribute materials to residential and urban watershed residents.</p> <p>Conduct workshops focusing on non-point source issues.</p> <p>Obtain funding to produce and distribute materials and to conduct workshops.</p>
BMPs	N/A

Objective 4 Establish riparian buffers in priority areas.

Actions/Milestones Identify priority sites for establishment of buffers.
 Contact landowners to obtain determine level of interest, cooperation and obtain permission.
 Obtain funding for implementation of five (5) buffer sites.
 Design the riparian plantings (develop a planting plan).
 Plant the buffers.
 Water quality monitoring.

BMPs Established buffers.

Objective 5 Address pollution from failing septic systems and illicit discharges in priority areas.

Actions/Milestones Work with Town sanitarians to evaluate the residential septic systems in the priority areas as defined by the WBP.
 Provide educational materials regarding septic system maintenance and municipal ordinances.
 Asses the sites.
 Report findings.
 Select sites for repair or enforcement.
 Work with landowners to implement repairs.
 Select and hire contractors.
 Repair systems.

BMPs Repaired septic systems and eliminated illicit discharges.

Objective 6 Implement ongoing water quality monitoring program in the watershed to develop baseline conditions and measure changes pre and post BMP implementation.

Actions/Milestones Identify specific locations for monitoring (10 - 15 sites). Sites should include at least one location (e.g. confluence) for each of the tributaries to the main stem and some sites along the main stem.
 Obtain funding for monitoring program.
 Develop monitoring parameters and program details.
 Train volunteers (if necessary).
 Monitor sites.
 Report results.
 Report that improves knowledge of originating locations of bacteria and other NPS pollutants.

BMPs N/A

Objective 7	Implement Place-Based BMPs—structural and non-structural measures to reduce bacteria loading along with nitrogen and other nonpoint source (NPS) pollutants.
Actions/Milestones	<p>Prioritize place-based sites.</p> <p>Select sites and contact landowners to determine level of interest and cooperation.</p> <p>Apply for grants and funding; obtain funding.</p> <p>Develop design for structural BMP implementation.</p> <p>Develop implementation plan for non-structural measures.</p> <p>Obtain proper permits.</p> <p>Construct structural measures; implement non-structural measures.</p> <p>Monitoring program to assess practice effectiveness.</p> <p>Construction of structural practices (e.g. stormwater wetlands, stormwater treatment units). Implementation of non structural practices (e.g. street sweeping, pet waste management, etc).</p>
BMPs	

Objective 8	Strengthen municipal land use regulations and Plans of Conservation and Development to protect water quality and minimize future water quality degradation issues.
Actions/Milestones	<p>Review the findings of the Regulations review (conducted as part of the WBP effort) with municipal officials and commissions (Examine regulations including but not limited to zoning, subdivision, wetlands, erosion and sedimentation).</p> <p>Gather existing model regulations to present to local officials and commission members.</p> <p>Work with local staff and commissions to develop regulations and language that reflect the interests of the local communities.</p> <p>Adoption of the new language, amendments, and regulations.</p> <p>Provide information regarding water quality, implementation municipal control measures.</p>
BMPs	N/A

8.0 WHERE ARE WE NOW?

Progress in implementing improvements in the Coginchaug River Watershed is already underway. Activities that have been completed or are ongoing (with responsible agency/organization) include the following.

- ◆ Pet waste stations have been installed at Wadsworth Falls State Park in Middletown/Middlefield (Conservation District), and are in the process of being installed for White's Farm and Allyn Brook Park in Durham (Town of Durham). Both of these projects have also involved development and distribution of outreach materials on the health and environmental risks of uncollected pet waste.
- ◆ Several projects have been initiated with agricultural operations in North Guilford, Durham and Middlefield to address water quality concerns or use of nutrients on fields (Conservation District, NRCS).
- ◆ A vegetated buffer is being installed at Butternut Pond in Middletown to help deter the resident goose population and filter pollutants from runoff (City of Middletown).
- ◆ A Coginchaug River cleanup was held at Veteran's Park in Middletown, intended to be an annual event cosponsored with the Middletown Regional Agricultural Science and Technology Center as part of the Connecticut River Watershed Council Source to Sea Cleanup (Conservation District).
- ◆ Educational materials geared toward homeowners/landowners have been distributed watershed-wide, at libraries and town halls. Materials include the Conservation District's guide focused on stewardship and protection of backyard water resources, and pamphlet on pet waste pick-up, among others (Conservation District).

In addition, the Conservation District established and is coordinating/ supporting activities of the Coginchaug River Watershed Based Plan Implementation Committee, charged with guiding implementation of the plan's recommendations. In addition to providing input for this Guided Summary, the Committee will help prioritize pollution reduction projects in the watershed; build coalitions and partnerships needed to successfully implement the plan; build support for the plan and promote implementation action; measure progress toward plan implementation; and implement water quality improvement projects within their purview. The Conservation District's role in coordinating activities of the Committee is funded in part by CT DEP through the US EPA Nonpoint Source grant under Section 319 of the Clean Water Act. It is anticipated that the Committee will continue its work for at least two years. A list of members is included as Appendix A.

This Guided Summary provides a snapshot of recommendations to restore and protect the watershed as they stand currently. Improving the watershed and its water quality will be an ongoing process that requires continued investigation and action, including water quality testing, monitoring of completed projects to determine effectiveness, field assessment for potential new projects, and revising outdated information. The summary should be considered a working document and updated periodically to include new information or recommendations, which will extend its life as a tool to guide and facilitate implementation of the watershed based plan.

Implementation action will be monitored to gage progress and inform future activities. A written report will be produced annually that documents watershed and place-based activities, and assesses the status of goals and objectives. This information will demonstrate success to date and help in guiding and inspiring further implementation work.