Chapter 6 -
Cape Fear River Subbasin 03-06-06
Includes Morgan Creek and Bolin Creek

6.1 Water Quality Overview

Subbasin 03-06-06 at a Glance

Land and Water Area (sq. mi.)

Total area:	75
Land area:	74
Water area:	1

Population Statistics

1990 Est. Pop.: 101,430 people
Pop. Density: 573 persons / mi^2

Land Cover (%)

Forest / Wetland:	84
Surface Water:	1.4
Urban:	5.3
Cultivated Crop:	0.6
Pasture / Managed Herbaceous:	8.6

Use Support Ratings

Freshwater Streams:

Fully Supporting:	46.7 mi.
Partially Supporting:	12.4 mi.
Not Supporting:	6.8 mi.
Not Rated:	9.0 mi.

Lakes:

University Lake - Fully Supporting

This small subbasin contains the urban and large suburban sections of Chapel Hill in Orange County. Relative to other subbasins in the Cape Fear River basin, it contains a large proportion of urban and built-up areas. This type of land use includes residential areas, institutional sites, construction sites and golf courses. Forest and agriculture, including pasture and cultivated cropland, also make up portions of the subbasin.

Small streams in this subbasin typically stop flowing during low flow periods due to the lack of groundwater recharge. USGS has estimated that Slate Belt streams with catchment areas of 18 square miles or less will have zero 7Q10 flows during summer low flow periods (USGS, 1993). A map of the subbasin, including water quality sampling locations, is presented in Figure B-6.

Biological ratings for these sample locations are presented in Table B-6. The current sampling resulted in impaired ratings for five streams in this subbasin. Refer to Appendix III for a complete listing of monitored waters and use support ratings. See Section A, Chapter 3, Table A-31 for a summary of lakes and reservoirs use support data.

There are 7 permitted dischargers in this subbasin. Most of these are very small, with the largest being the OWASA/Mason Farm WWTP. This facility has a permitted flow of 8.0 MGD into Morgan Creek. The facility has an instream waste concentration of 93% during 7Q10 flow conditions.

Data from Morgan Creek and the Bolin/Booker/Little Creeks watershed indicate a downstream decline in water quality. Good or Excellent water quality results are recorded from upstream sites and water quality degrades, as the streams flow through urban and suburban sections of Chapel Hill.

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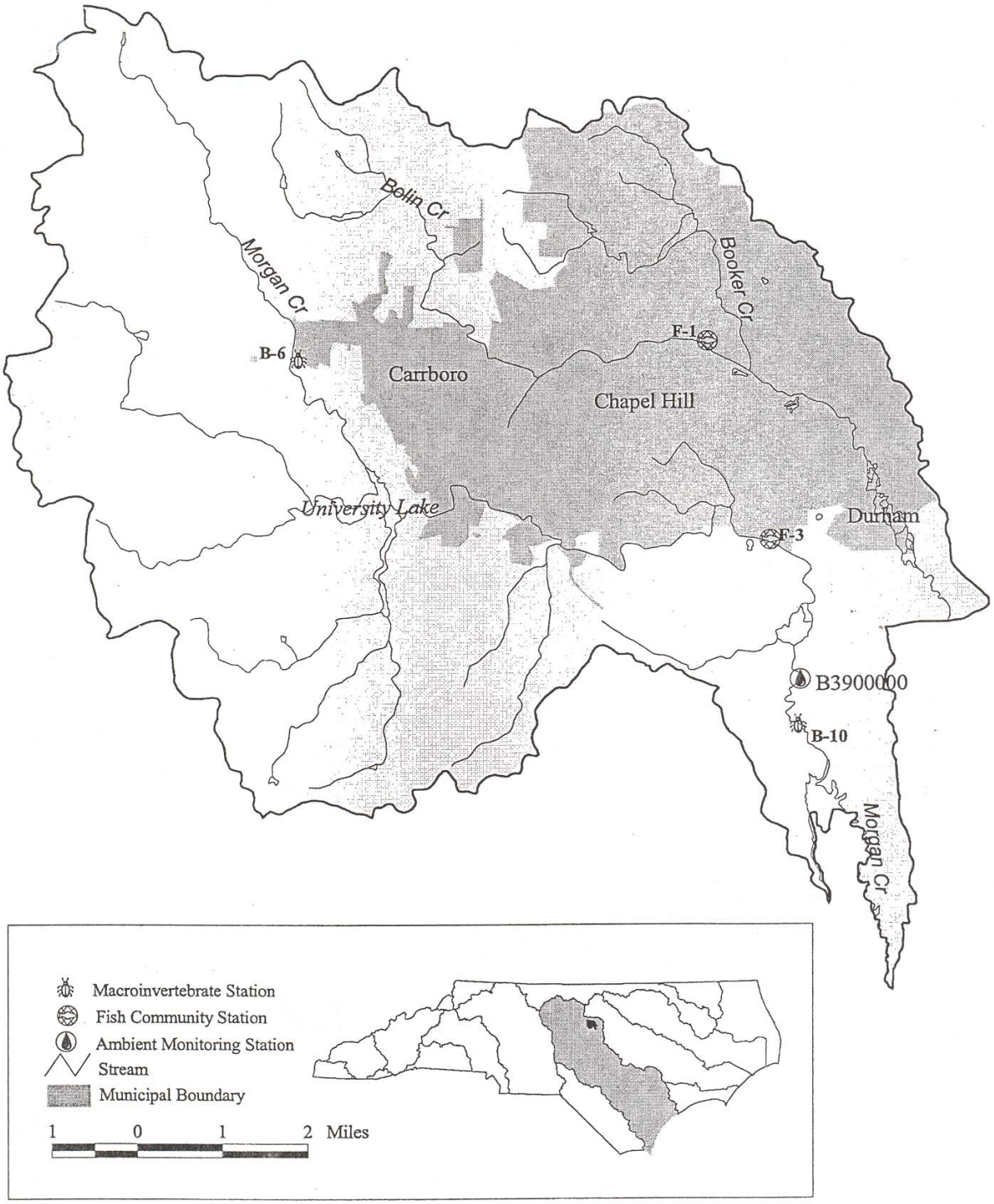

Figure B-6 Sampling Locations within Subbasin 03-06-06

Table B-6 Biological Assessment Sites in Cape Fear River Subbasin 03-06-06

BENTHOS				***Bioclassification***	
Site #	**Stream**	**County**	**Location**	**1993**	**1998**
B-6	Morgan Creek	Orange	NC 54	Excellent (w) Good (s)	Excellent (w) -
B-10	Morgan Creek	Orange	SR 1726	Fair (s)	Fair (s)
FISH				***Bioclassification***	
Site #	**Stream**	**County**	**Location**	**1994**	**1998**
F-1	Bolin Creek	Orange	off SR 1750	no sample	Poor
F-3	Morgan Creek	Orange	SR 1900	no sample	Poor

(w) Winter collection, (s) Summer collection

For more detailed information on water quality in this subbasin, refer to *Basinwide Assessment Report – Cape Fear River Basin – June 1999*, available from DWQ Environmental Sciences Branch at (919) 733-9960.

6.2 Impaired Waters

Portions of Meeting of the Waters, Morgan and Bolin Creeks were identified as impaired in the 1996 Cape Fear River Basinwide Water Quality Plan. Portions of Meeting of the Waters, Morgan, Bolin, Booker and Little Creeks are currently rated as impaired according to recent DWQ monitoring. Current status of each of these streams is discussed below. Prior recommendations, future recommendations and projects aimed at improving water quality for these waters are also discussed when applicable. 303(d) listed waters are summarized in Part 6.3 and waters with other issues, recommendations or projects are discussed in Part 6.4.

Meeting of the Waters

Current Status

Meeting of the Waters was identified as not supporting (NS) in the 1996 basinwide plan because of an impaired biological community. Meeting of the Waters (1.4 miles from source to Morgan Creek) was resampled and is currently not supporting (NS) according to recent DWQ monitoring because of an impaired biological community. Instream habitat degradation associated with urban nonpoint sources is a possible cause of impairment. This stream drains heavily urbanized areas of UNC-Chapel Hill. Meeting of the Waters is on the state's year 2000 303(d) list (not yet EPA approved).

2000 Recommendations

Meeting of the Waters is impaired from urban nonpoint sources in Chapel Hill. The City of Chapel Hill will be required to address stormwater issues as part of Phase II of the NPDES

stormwater program. NPDES stormwater permit applications must be received by DWQ by March 1, 2003. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

Morgan Creek

1996 Plan Recommendations

The 1996 Cape Fear River Basinwide Plan identified two segments of the Morgan Creek (8.6 miles from SR 1919 to Jordan Reservoir) as partially supporting (PS) because of an impaired biological community. Sedimentation and fecal coliform bacteria were listed as possible causes of impairment. The 1996 plan recommended that no new discharges should be permitted in this stream.

Current Status

No new discharges have been permitted into this stream. The sample segments of Morgan Creek have been redefined. Approximately three miles of Morgan Creek between SR 1919 and Meeting of the Waters has improved since the last sampling period and is no longer impaired. Two segments of Morgan Creek (5.1 miles from Meeting of the Waters to Jordan Reservoir) are partially supporting (PS) and not supporting (NS) according to recent DWQ monitoring because of an impaired biological community. These two segments are on the state's year 2000 303(d) list (not yet EPA approved). Instream habitat degradation associated with urban nonpoint sources is a possible cause of impairment. Manganese is also listed as a problem parameter for both stream segments. For more information on unimpaired segments of Morgan Creek, refer to Part 6.4 below.

2000 Recommendations

The City of Chapel Hill will be required to address stormwater issues as part of Phase II of the NPDES stormwater program. NPDES stormwater permit applications must be received by DWQ by March 1, 2003. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

Bolin Creek

Current Status

Bolin Creek (1 mile from NC 501 to Little Creek) was identified as partially supporting (PS) in the 1996 basinwide plan because of an impaired biological community. This same segment of Bolin Creek is partially supporting (PS) according to recent monitoring because of an impaired biological community. Instream habitat degradation associated with urban nonpoint sources is a possible cause of impairment. Bolin Creek is on the state's year 2000 303(d) list (not yet EPA approved).

2000 Recommendations

Bolin Creek is impaired from urban nonpoint sources in Chapel Hill. The City of Chapel Hill will be required to address stormwater issues as part of Phase II of the NPDES stormwater program. NPDES stormwater permit applications must be received by DWQ by March 1, 2003. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

Booker Creek

Current Status

Booker Creek (5.6 miles from source to Little Creek) is partially supporting (PS) according to recent DWQ monitoring because of an impaired biological community. Instream habitat degradation associated with urban nonpoint sources is a possible cause of impairment. Booker Creek is on the state's year 2000 303(d) list (not yet EPA approved).

2000 Recommendations

Booker Creek is impaired from urban nonpoint sources in Chapel Hill. The City of Chapel Hill will be required to address stormwater issues as part of Phase II of the NPDES stormwater program. NPDES stormwater permit applications must be received by DWQ by March 1, 2003. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

Little Creek

Current Status

Little Creek (6.1 miles from source to New Hope Creek) is not supporting (NS) according to recent DWQ monitoring because of an impaired biological community. Instream habitat degradation associated with urban nonpoint sources is a possible source of impairment. The 0.7-mile segment upstream of New Hope River Arm of Jordan Reservoir is partially supporting (PS) for the same reasons. Little Creek is on the state's year 2000 303(d) list (not yet EPA approved).

2000 Recommendations

Little Creek is impaired from urban nonpoint sources in Chapel Hill. The City of Chapel Hill will be required to address stormwater issues as part of Phase II of the NPDES stormwater program. NPDES stormwater permit applications must be received by DWQ by March 1, 2003. The 303(d) list approach will be to resample for biological and chemical data to attempt to determine potential problem parameters.

6.3 303(d) Listed Waters

There are 5 streams (19.2 stream miles) in the subbasin that are impaired and on the state's year 2000 303(d) list (not yet EPA approved). Segments of Meeting of the Waters, Morgan, Bolin, Booker and Little Creeks are discussed above. For information on 303(d) listing requirements and approaches, refer to Appendix IV.

6.4 Other Issues, Recommendations and Projects

Morgan Creek upstream of Meeting of the Waters is rated as fully supporting (FS) using recent DWQ monitoring data. However, this stream may still be affected by urban runoff that has the potential to degrade water quality and instream habitat. Addressing stormwater runoff in Chapel Hill should reduce future impacts to water quality in Morgan Creek. Although no action is required for these surface waters, continued monitoring is recommended. DWQ encourages the use of voluntary measures to prevent water quality degradation. Education on local water quality issues is always a useful tool to prevent water quality problems and to promote restoration efforts. For information on water quality education programs, workshops and nonpoint source agency contacts, see Appendix V.

Approximately 40% of the waters in this subbasin are impaired by nonpoint source pollution (mostly urban). All the waters of the subbasin are affected by nonpoint sources. DENR, other state agencies and environmental groups have programs and initiatives underway to address water quality problems associated with nonpoint sources. DWQ will notify local agencies of water quality concerns in this subbasin and work with these various agencies to conduct further monitoring, as well as assist agency personnel with locating sources of funding for water quality protection.

Upper Cape Fear River Basin Association

The Upper Cape Fear River Basin Association (UCFRBA) is starting to sample 45 sites in the upper Deep and Haw River watersheds. The data will be analyzed to support various studies and will be used with DWQ data to develop use support ratings for waters in the Cape Fear River basin during the upcoming basinwide cycle.

Chapel Hill Stream Monitoring

The Town of Chapel Hill currently monitors 14 sites monthly in area streams. The town will also be performing watershed and stream assessments as part of the stormwater management program.