

**Appendix 2**  
**Habitat Data**

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Buckhorn Creek

**Date:** 6/10/2003

**Point of Assessment:** 2BM4

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	14	13
Epifaunal Substrate	12	12
Embeddedness	16	15
Channel Alteration	13	11
Sediment Deposition	15	11
Frequency of Riffles	14	12
Channel Flow Status	16	16
Bank Vegetative Protection		
Left Bank	6	7
Right Bank	6	7
Bank Stability		
Left Bank	6	6
Right Bank	6	6
Vegetated Buffer Zone Width		
Left Bank	9	9
Right Bank	9	9
<b>Total Score:</b>	<b>142</b>	<b>134</b>

Productive habitats expected for the stream type make up 50-70% of the reach  
riffle substrate is a mixture of gravel stones and or stable woody debris  
20% of the stream is embedded by small sediments (less than 2 mm) and silt  
some alteration has taken place, but greater than 20 years ago  
20-50% of the bottom is affected by sand or silt accumulation. There is slight deposition in pools  
water reaches the base of both lower banks and there is a minimal amount of substrate exposed

a variety of vegetation is present and covers 70-90% of streambank surface.  
a variety of vegetation is present and covers 70-90% of streambank surface.

Moderately stable banks with small areas of erosion or bank slumping visible.30-40% has erosional areas.  
Moderately stable banks with small areas of erosion or bank slumping visible.30-40% has erosional areas.

Forest  
Forest

**Vegetation Notes:**

**TREES**

Red Maple      Red Cedar  
Tulip Poplar    Red Oak  
Green Ash        Sweet Gum  
Flowering Dogwood    River Birch  
   American Holly

American Beech

Ironwood/Sourwood  
Willow Oak  
White Oak  
Redbud

**HERBS/VINES**

Panicum                      Poison Ivy  
Microstegium                Virginia Creeper  
Christmas Fern                Sycamore Saplings  
Grape

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Buckhorn Creek @ Buckhorn Duncan Rd

**Date:** 7/21/2003

**Point of Assessment:** 2BT12

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
M. Hilhorst   Jessica Rohrbach

Parameter	Score	Score	
Instream Cover (fish)	13	6	Productive habitats make up 50% of the stream
Epifaunal Substrate	11	11	the substrate is composed of a mixture of gravel stones and bedrock
Embeddedness	12	12	fine sediment and silt surrounds and fills 25-50% of the living spaces around and in the substrate
Channel Alteration	16	15	no evidenc of disturbance
Sediment Deposition	11	14	20-50% of the bottom is affected by deposition with slight deposition in pools
Frequency of Riffles	13	19	riffles are present
Channel Flow Status	18	17	water reaches the base of both lower banks and minimal amount of channel substrate is exposed.
Bank Vegetative Protection			
Left Bank	9	5	70-90% of the streambank surface is covered by vegetation
Right Bank	9	5	70-90% of the streambank surface is covered by vegetation
Bank Stability			
Left Bank	8	7	streambanks are moderately stable with small areas of erosion or banks slumping visible.
Right Bank	8	7	10-20% of bank has erosional areas
Vegetated Buffer Zone Width			
Left Bank	9	10	Forest
Right Bank	10	10	Forest
<b>Total Score:</b>	<b>147</b>	<b>138</b>	

### Vegetation Notes:

#### TREES

Red Maple

Ironwood/Sourwood

American Holly

Oak sp.

River Birch

Sweet Gum

#### SHRUBS/UNDERSTORY

Sassafrass

#### HERBS/VINES

Grape Vine

Smilax

Christmas Fern

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Little White Oak

**Date:** 6/19/2003

**Point of Assessment:** 2LWOM2

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
M. Wight   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	11	11
Epifaunal Substrate	6	6
Embeddedness	3	5
Channel Alteration	14	14
Sediment Deposition	9	6
Frequency of Riffles	12	13
Channel Flow Status	20	20
Bank Vegetative Protection		
Left Bank	5	6
Right Bank	4	4
Bank Stability		
Left Bank	4	5
Right Bank	5	4
Vegetated Buffer Zone Width		
Left Bank	10	9
Right Bank	10	10
<b>Total Score:</b>	<b>113</b>	<b>113</b>

Productive habitats make up only 50% of the reach  
 substrate is dominated by sand/gravel stones and stable woody debris

90% of the reach is embedded by sediment and silt

10% or less of the reach has been altered

80% of the the stream bottom is affected with moderate deposition in pools

minimal amount of channel substrate is exposed

60-70% of the streambank surface is covered by vegetation, typically scattered shrubs, grasses, & forbs

60-70% of the streambank surface is covered by vegetation, typically scattered shrubs, grasses, & forbs

moderately unstable banks with 50% of the bank area experiencing erosion

moderately unstable banks with 50% of the bank area experiencing erosion

Forest

Forest

### Vegetation Notes:

#### TREES

Red Maple                      White Oak  
 Tulip Poplar                  American Holly  
 Sweet Gum                      American Beech  
 Flowering Dogwood          Ironwood/Sourwood  
 Red Cedar

#### HERBS/VINES

Panicum                      Briar  
 Microstegium              Privet  
 Christmas Fern  
 Grape  
 Poison Ivy

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Big Branch at Woods Creek Rd (SR1154)

**Date:** 5/2/2003

**Point of Assessment:** 2WOM1

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
J.Rohrbach   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	14	14
Epifaunal Substrate	12	12
Embeddedness	6	4
Channel Alteration	15	15
Sediment Deposition	10	7
Frequency of Riffles	16	15
Channel Flow Status	15	16
Bank Vegetative Protection		
Left Bank	6	8
Right Bank	6	8
Bank Stability		
Left Bank	5	7
Right Bank	5	7
Vegetated Buffer Zone Width		
Left Bank	9	9
Right Bank	9	9
<b>Total Score:</b>	<b>128</b>	<b>131</b>

Productive habitat(s) expected for stream type make up 50-70% of the reach  
 moderate rating for benthic habitat for insects and snails to colonize (may not be pertinent in sand bed stream)

70% embeddedness with sediment and silt, particle sizes less than 2mm.

channel disturbance is greater than 20 years old.

habitats smothered by sand, silt, and small gravel

may not be pertinent due to sand bed stream

less than 25% of the channel substrate is exposed

a variety of vegetation is present and covers 70-90% of the streambank surface

a variety of vegetation is present and covers 70-90% of the streambank surface

40-50% of the bank has small areas of erosion

40-50% of the bank has small areas of erosion

Forest

Forest

**Vegetation Notes:**

**TREES**

Red Maple      Red Oak  
 Tulip Poplar    Sweet Gum  
 Sycamore        River Birch  
 Loblolly Pine  
 White Oak

**SHRUBS/UNDERSTORY**

Ironwood/Sourwood  
 Dogwood        Deciduous Holly  
 Blueberry       Giant Cane  
 American Holly  
 Water Oak

**HERBS/VINES**

Panicum  
 Microstegium  
 Christmas Fern  
 Grape  
 Jack-in Pulpit

New York Fern (?)  
 Cardinal Flower (?)  
 Virginia Creeper  
 Smilax  
 Clad  
 Heartleaf  
 Carex

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Tributary to White Oak Creek

**Date:** 6/10/2003

**Point of Assessment:** 2WOT16

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score	
Instream Cover (fish)	13	19	70% of the stream has productive habitats expected for the stream type
Epifaunal Substrate	12	6	mixture of gravel stones, woody debris
Embeddedness	13	11	fine sediment and silt surround the living spaces around and between gravel
Channel Alteration	15	14	Disturbance is more than 20 years old
Sediment Deposition	6	7	50-80% of the bottom is affected with moderate deposition in pools. Habitats are smothered by sand.
Frequency of Riffles	13	14	
Channel Flow Status	11	11	<25% of the channel substrate is exposed
Bank Vegetative Protection			
Left Bank	3	5	50-70% vegetation cover is typically shrubs grasses and forbs
Right Bank	3	4	50-70% vegetation cover is typically shrubs grasses and forbs
Bank Stability			
Left Bank	4	5	50-60% of the bank has erosional areas
Right Bank	4	4	50-60% of the bank has erosional areas
Vegetated Buffer Zone Width			
Left Bank	9	8	old field. Herbaceous and shrub species. Few if any trees
Right Bank	9	9	old field. Herbaceous and shrub species. Few if any trees
<b>Total Score:</b>	<b>115</b>	<b>117</b>	

### Vegetation Notes:

#### TREES

Red Maple	Red Oak	Ironwood/Sourwood
Tulip Poplar	Sweet Gum	Willow Oak
Green Ash	River Birch	White Oak
Flowering Dogwood	American Holly	Redbud
Red Cedar	American Beech	

#### HERBS/VINES

Panicum	Virginia Creeper
Microstegium	Sycamore Saplings
Christmas Fern	
Grape	
Poison Ivy	

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Avents Creek at Cokesbury Rd

**Date:** 7/18/2003

**Point of Assessment:** 3LAM2

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
M. Hilhorst   Marshall Wight

Parameter	Score	Score	
Instream Cover (fish)	18	19	productive habitats expected for the stream type make up more than 70% of the reach
Epifaunal Substrate	12	12	the substrate is a diverse mixture of gravel, cobble, sand and bedrock
Embeddedness	13	13	40% embeddedness by sediment less than 2mm in diameter
Channel Alteration	18	15	no evidence of disturbance with bends and combination of riffle/runs and glide/pools frequent
Sediment Deposition	9	11	50% of the stream bottom is affected with moderate deposition in pools.
Frequency of Riffles	16	17	
Channel Flow Status	18	20	water reaches the base of both lower banks and there is a minimal amount of channel substrate exposed.
Bank Vegetative Protection			
Left Bank	10	9	more than 90% of the streambank surface is covered by native/natural vegetation.
Right Bank	10	9	
Bank Stability			
Left Bank	9	9	less than 10% of the banks are affected by erosion
Right Bank	9	8	
Vegetated Buffer Zone Width			
Left Bank	9	10	Forest
Right Bank	10	10	Forest
<b>Total Score:</b>	<b>161</b>	<b>162</b>	

### Vegetation Notes:

#### TREES

Ironwood  
River Birch  
Dogwood  
American Holly

#### HERBS/VINES

Smilax  
Microstegium  
Christmas Fern  
Carex

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Mill Creek @ Raven Rock State Park

**Date:** 6/10/2003

**Point of Assessment:** 3LAT7

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score	
Instream Cover (fish)	20	20	Productive habitats expected for the stream type make up more than 70% of the reach
Epifaunal Substrate	20	20	substrate composed of cobble and coarse gravel
Embeddedness	17	17	20% embeddedness by sediment less than 2mm
Channel Alteration	18	15	one said no alteration, the other said alteration older than 20 years
Sediment Deposition	18	18	less than 20% pool accumulation with accumulation in pools only
Frequency of Riffles	19	19	
Channel Flow Status	16	16	water reaches the base of both lower banks and minimal amount of channel substrate is exposed.
Bank Vegetative Protection			
Left Bank	9	9	90% of the streambank surface is covered by native/natural vegetation
Right Bank	9	9	90% of the streambank surface is covered by native/natural vegetation
Bank Stability			
Left Bank	9	9	less than 10% of the banks are affected by erosion
Right Bank	9	9	less than 10% of the banks are affected by erosion
Vegetated Buffer Zone Width			
Left Bank	10	9	forested
Right Bank	9	9	forested
<b>Total Score:</b>	<b>183</b>	<b>179</b>	

**Vegetation Notes:**

**TREES**

Red Maple                      Red Oak  
 Tulip Poplar                  Sweet Gum  
 Sycamore                        River Birch  
 Loblolly Pine  
 White Oak

**SHRUBS/UNDERSTORY**

Ironwood/Sourwood  
 Dogwood                      Deciduous Holly  
 Blueberry                      Giant Cane  
 American Holly  
 Water Oak

**HERBS/VINES**

Panicum  
 Microstegium                  Virginia Creeper  
 Christmas Fern                Smilax  
 Grape                              Clad  
 Jack-in Pulpit                  Heartleaf  
 New York Fern (?)                Carex  
 Cardinal Flower (?)

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

Stream: Hector Creek

Date: 7/24/2003

Point of Assessment: 3LHM3

County: Harnett

River Basin: Cape Fear

Assessor Assessor  
M. Hilhorst Jessica Rohrbach

Parameter	Score	Score
Instream Cover (fish)	15	13
Epifaunal Substrate	11	16
Embeddedness	13	11
Channel Alteration	11	12
Sediment Deposition	11	12
Frequency of Riffles	18	18
Channel Flow Status	18	17
Bank Vegetative Protection		
Left Bank	9	7
Right Bank	9	7
Bank Stability		
Left Bank	8	8
Right Bank	8	8
Vegetated Buffer Zone Width		
Left Bank	8	7
Right Bank	5	7
<b>Total Score:</b>	<b>144</b>	<b>143</b>

Productive habitats make up only 50% of the reach  
 cobble, gravel, and bedrock  
 30-50% embeddedness Fine silt and sediment surround the living spaces between the gravel and cobble  
 40% of the channel has been disturbed, but the disturbance occurred more than 20 years ago  
 50% of the bottom is affected by sand or silt accumulation, there is slight deposition in the pools  
 water reaches the base of both lower banks and a minimal amount of channel substrate is exposed.  
 A variety of vegetation is present and covers 80% of the stream bank surface  
 the stream banks are moderately stable with small areas of erosion or bank slumping is visible  
 early successional growth on disturbed land, forested vegetated buffer zone 30-50 feet wide

### Vegetation Notes:

#### TREES

Alder Red Maple  
 American Holly  
 River Birch  
 Ironwood  
 Tulip Poplar

#### HERBS/VINES

Yellow Root  
 Christmas Fern  
 River Cane

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Cooper Creek at Kipling Rd (Lower Hectors Creek Trib)

**Date:** 7/21/2003

**Point of Assessment:** 3LHT4

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
M. Hilhorst   Jessica Rohrbach

Parameter	Score	Score
Instream Cover (fish)	14	12
Epifaunal Substrate	11	11
Embeddedness	15	14
Channel Alteration	15	15
Sediment Deposition	14	15
Frequency of Riffles	18	15
Channel Flow Status	18	17
Bank Vegetative Protection		
Left Bank	9	7
Right Bank	9	7
Bank Stability		
Left Bank	9	7
Right Bank	9	7
Vegetated Buffer Zone Width		
Left Bank	10	8
Right Bank	10	8
<b>Total Score:</b>	<b>161</b>	<b>143</b>

Productive habitats comprise 60% of the reach  
substrate is composed of a tri modal distribution of small cobble, coarse gravel, and fine sand  
fine sediment and silt surrounds and fills 25% of the living spaces around and between gravel and cobble  
disturbance is greater than 20 years old  
25% of the bottom is affected by sand or silt accumulation with slight deposition seen in pools  
water reaches the base of both lower banks and a minimal amount of substrate is exposed.

A variety of vegetation is present and covers 90% of the stream bank surface.  
Some open areas with unstable vegetation is present

Around 10% of the stream banks area affected by erosional areas  
Around 10% of the stream banks area affected by erosional areas

forested land cover  
forested land cover

### Vegetation Notes:

#### TREES

American Holly      Ironwood/Sourwood  
Red Maple              Dogwood  
Elm                        Pine sp.  
Tulip Poplar  
Oak sp.

#### SHRUBS/UNDERSTORY

Giant Cane  
Virginia Willow

#### HERBS/VINES

Smilax                      Jewel Weed  
Microstegium              False Nettle  
Christmas Fern  
Yellow Root  
Poison Ivy

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Trib to Hector Creek

**Date:** 7/24/2003

**Point of Assessment:** 3LHT8

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
 J.Rohrbach   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	11	11
Epifaunal Substrate	10	10
Embeddedness	4	7
Channel Alteration	15	13
Sediment Deposition	17	14
Frequency of Riffles	16	15
Channel Flow Status	15	18
Bank Vegetative Protection		
Left Bank	7	7
Right Bank	7	7
Bank Stability		
Left Bank	9	9
Right Bank	9	9
Vegetated Buffer Zone Width		
Left Bank	6	8
Right Bank	8	8
<b>Total Score:</b>	<b>134</b>	<b>136</b>

Productive habitats make up less than 50% of the reach  
 substrate is dominated by cobble  
 70-80% embeddedness by sediment and silt  
 20% of the reach is affected by alteration but it is greater than 20 years old  
 20-35% of the bottom is affected by sand or silt accumulation.  
 water fills greater than 85% of the channel  
 80% plant cover with a few barren or thin areas present  
 80% plant cover with a few barren or thin areas present  
 less than 10% of the bank is affected by erosion  
 less than 10% of the bank is affected by erosion  
 early succession growth, predominantly shrubs with a few trees  
 early succession growth, predominantly shrubs with a few trees

### Vegetation Notes:

#### TREES

Alder                      Red Maple  
 American Holly  
 River Birch  
 Ironwood  
 Tulip Poplar

#### HERBS/VINES

Yellow Root  
 Christmas Fern  
 River Cane

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Parkers Creek at Wade Stevenson Rd

**Date:** 2/6/2003

**Point of Assessment:** 3PM1

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score	
Instream Cover (fish)	15	15	productive habitat expected for the stream type is seen in 70% of the reach
Epifaunal Substrate	16	16	mixture of cobble and course gravel
Embeddedness	17	17	20% of the stream was imbedded by small sediments <2mm and silt
Channel Alteration	14	14	very little channel alteration, what was altered was altered >20 years ago
Sediment Deposition	16	16	less than 20% of the reach is affected by sediment deposition
Frequency of Riffles	16	17	riffles are present
Channel Flow Status	13	13	less than 25% of the channel substrate is exposed
Bank Vegetative Protection			
Left Bank	6	6	a variety of vegetation is present and covers 70% of the streambank surface with a few barren areas
Right Bank	5	5	
Bank Stability			
Left Bank	7	8	moderately stable banks with small areas of erosion or bank slumping visible.
Right Bank	7	8	
Vegetated Buffer Zone Width			
Left Bank	9	9	forest planted lawn grass
Right Bank	6	6	
<b>Total Score:</b>	147	150	

### Vegetation Notes:

#### TREES

White Oak  
 Swamp Chestnut Oak  
 American Holly  
 Dogwood

Red Maple                      Sweet Gum  
 Tulip Poplar  
 Green Ash  
 Northern Red Oak  
 Elm

#### HERBS/VINES

Honeysuckle  
 Christmas Fern  
 Arundinaria

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Parkers Creek at Ball Rd

**Date:** 2/6/2003

**Point of Assessment:** 3PM2

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score	
Instream Cover (fish)	15	15	productive habitats expected for this stream type were present in 70% of the reach
Epifaunal Substrate	12	12	the substrate was dominated by cobble and gravel with sand
Embeddedness	11	10	fine sediment and silt surrounds and fills 50-75% of the living spaces around and inbetween gravel and cobble
Channel Alteration	14	14	Any human disturbance of the channel is more than 20 years old and comprises less than 10% of the channel
Sediment Deposition	9	9	50-65% of the stream bed is affected with moderate deposition in pools. Habitats are smothered by sand, silt and fine gravel
Frequency of Riffles	17	19	
Channel Flow Status	16	16	water reaches the base of both lower banks and a minimal amount of the substrate is exposed.
Bank Vegetative Protection			
Left Bank	4	5	70% of the streambank surface is covered by vegetation
Right Bank	4	5	70% of the streambank surface is covered by vegetation
Bank Stability			
Left Bank	3	5	the banks are moderately unstable with 40% of the bank area experiencing some erosion
Right Bank	3	5	the banks are moderately unstable with 40% of the bank area experiencing some erosion
Vegetated Buffer Zone Width			
Left Bank	9	9	forested
Right Bank	9	9	forested
<b>Total Score:</b>	<b>126</b>	<b>133</b>	

**Vegetation Notes:**

**TREES**

Red Oak  
Tulip Poplar  
Sycamore  
River Birch

Dogwood  
American Holly  
Green Ash  
Beech Saplings  
Red Maple

Red Cedar  
Loblolly Pine  
Hickory  
Ironwood/Sourwood

**SHRUBS/UNDERSTORY**

Spicebush  
Giant Cane

**HERBS/VINES**

Lycopodium  
Microstegium  
Christmas Fern  
Carex  
Crossvine  
Carex  
Smilax

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Parker's Creek

**Date:** 6/10/2003

**Point of Assessment:** 3PM3

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	19	20
Epifaunal Substrate	17	17
Embeddedness	18	16
Channel Alteration	18	20
Sediment Deposition	17	15
Frequency of Riffles	18	19
Channel Flow Status	18	18
Bank Vegetative Protection		
Left Bank	7	9
Right Bank	7	9
Bank Stability		
Left Bank	8	9
Right Bank	8	9
Vegetated Buffer Zone Width		
Left Bank	10	9
Right Bank	10	9
<b>Total Score:</b>	<b>175</b>	<b>179</b>

productive habitats expected for the stream type make up >70% of the stream. All habitats are common mixture of cobble and gravel with stable woody debris

Little or no embeddedness present by fine silt and or sediment surrounding and covering rocks

no evidence of channel disturbance

very little sediment deposition detected

water reaches the base of both lower banks and minimal amount of channel substrate is exposed

a variety of vegetation is present and covers 70-90% of the streambank surface.  
 Some open areas with unstable vegetation are present, but less than 10%

less than 10% of the bank is affected by erosion

forested

forested

**Vegetation Notes:**

**TREES**

Red Maple                      Hickory  
 Tulip Poplar                  Souther Red Oak  
 Cucumber Tree              Sweet Gum  
 Loblolly Pine                  River Birch  
    Northern Red Oak  
    American Beech

**SHRUBS/UNDERSTORY**

Ironwood/Sourwood      Ostuga Virginica  
 Dogwood                    Red Cedar  
 Blueberry                    Witch Hazel  
 American Holly            Wild Azalea  
 Pawpaw

**HERBS/VINES**

Panicum                      Cohosh  
 Microstegium              Jack-in Pulpit  
 Christmas Fern            Running Cedar  
 Grape                         Maple leaf Viburnum  
 Poison Ivy

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Tributary to Avents Creek

**Date:** 2/6/2003

**Point of Assessment:** 3UAT16

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	14	14
Epifaunal Substrate	12	12
Embeddedness	15	17
Channel Alteration	9	9
Sediment Deposition	15	15
Frequency of Riffles	13	13
Channel Flow Status	15	15
Bank Vegetative Protection		
Left Bank	5	5
Right Bank	6	6
Bank Stability		
Left Bank	5	5
Right Bank	5	5
Vegetated Buffer Zone Width		
Left Bank	3	3
Right Bank	4	4
<b>Total Score:</b>	121	123

productive habitats expected for this stream type make up 50-70% of the reach  
 substrate is predominantly coarse gravel with some small cobble and some sand  
 fine sediment and silt surround and fill 25-50% of the living spaces around and in between the gravel  
 the reach has been disturbed and disturbance may be less than 20 years old  
 20-50% of the stream bed substrate is affected by sand or silt accumulation, there is slight deposition in the pools  
 less than 25% of the channel substrate is exposed  
 70% of the streambank surface is covered by vegetation, typically composed of grasses and forbs  
 moderately unstable bank, the frequency and size of raw areas are such that high water events  
 have eroded some areas of the bank. Some bank slumping is visible.  
 planted lawn grass  
 old field

**Vegetation Notes:**

**TREES**

- Red Maple
- White Oak
- Sweet Gum
- River Birch

**HERBS/VINES**

- Privet
- Honey Suckle

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Kenneth Creek downstream of Wagstaff Rd.

**Date:** 1/21/2003

**Point of Assessment:** 4KM1

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
S. Unger   Greg Price/John Hutton  
B. Duncan

<b>Parameter</b>	<b>Score</b>	<b>Score</b>
Instream Cover (fish)	7	6
Epifaunal Substrate	12	7
Embeddedness	10	9
Channel Alteration	12	11
Sediment Deposition	11	9
Frequency of Riffles	14	12
Channel Flow Status	11	11
Bank Vegetative Protection		
Left Bank	1	1
Right Bank	1	1
Bank Stability		
Left Bank	1	1
Right Bank	1	1
Vegetated Buffer Zone Width		
Left Bank	5	4
Right Bank	5	4
<b>Total Score:</b>	<b>91</b>	<b>77</b>

Less than 50% of the reach has productive habitats  
 substrate is a mixture of cobble and gravel  
 fine sediments surround and fill 50% of the living spaces around and in between gravel and cobble  
 some channel alterations have taken place, but more than 20 years ago.  
 50% of the bottom is affected by sand or silt accumulation. Some habitats are smothered by fines.  
 water fills 75% of the available channel. 25% of the substrate is exposed  
 20% of the streambanks are covered by vegetation. 2 inches or less of average stubble height remain.  
 80-90% of the streambanks are experiencing erosional areas.  
 80-90% of the streambanks are experiencing erosional areas.  
 Planted lawn grass  
 Planted lawn grass

**Vegetation Notes:**

**TREES**

- Sweet Gum
- White Oak
- American Holly
- Red Maple

**SHRUBS/UNDERSTORY**

- Privet

**HERBS/VINES**

- Arundinaria
- Crossvine
- Honeysuckle
- Christmas Fern

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Kenneth Creek at Chalybeate Springs

**Date:** 2/6/2003

**Point of Assessment:** 4KM5

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	19	20
Epifaunal Substrate	17	17
Embeddedness	15	17
Channel Alteration	16	16
Sediment Deposition	12	12
Frequency of Riffles	16	17
Channel Flow Status	16	16
Bank Vegetative Protection		
Left Bank	7	7
Right Bank	7	7
Bank Stability		
Left Bank	6	5
Right Bank	6	5
Vegetated Buffer Zone Width		
Left Bank	9	9
Right Bank	5	5
<b>Total Score:</b>	<b>151</b>	<b>153</b>

Productive habitats make up over 70% of the reach  
 substrate is composed of a mixture of cobble, gravel and or woody debris  
 fine sediment surrounds and fills 20-30% of the living spaces around and inbetween gravel, cobble.  
 no evidence of disturbance

water reaches the base of both lower banks and a minimal amount of substrate is exposed.

a variety of vegetation is present and covers 80% of streambank surface.  
 Disruption is evident but not affecting full plant growth potential.

moderately stable banks with small areas of erosion or bank slumping visible.  
 Most areas are stable with only slight potential for erosion at flood stages.

Forest  
 active pasture

**Vegetation Notes:**

**TREES**

Red Maple                      Red Oak  
 Tulip Poplar                  Sweet Gum  
 Sycamore                        River Birch  
 Loblolly Pine

**SHRUBS/UNDERSTORY**

Ironwood/Sourwood  
 Dogwood                      Deciduous Holly  
 Blueberry                      Giant Cane  
 American Holly  
 Water Oak

**HERBS/VINES**

Panicum  
 Microstegium  
 Christmas Fern  
 Grape  
 Jack-in Pulpit

**Cardinal Flower (?)**

Virginia Creeper  
 Smilax  
 Clad  
 Heartleaf  
 Carex

White Oak

New York Fern (?)

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** UT TO Kenneth Creek upstream of Wagstaff Rd

**Date:** 1/21/2003

**Point of Assessment:** 4KT13

**County:** Wake

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
 S. Unger   Greg Price/John Hutton  
 B. Duncan

Parameter	Score	Score
Instream Cover (fish)	19	18
Epifaunal Substrate	12	17
Embeddedness	16	14
Channel Alteration	15	16
Sediment Deposition	14	15
Frequency of Riffles	18	17
Channel Flow Status	13	16
Bank Vegetative Protection		
Left Bank	8	5
Right Bank	8	5
Bank Stability		
Left Bank	8	6
Right Bank	8	6
Vegetated Buffer Zone Width		
Left Bank	9	8
Right Bank	9	9
<b>Total Score:</b>	157	152

Productive habitats common for 70% of the reach  
 the substrate is a mixture of gravel, cobble, and stable woody debris  
 There is little to no embeddedness present by fine silt and or sediment surrounding and covering rocks  
 Channel disturbance is more than 20 years old  
 20% of the bottom is affected by sand or silt accumulation, there is slight deposition in the pools.  
 Water reaches the base of both lower banks and a minimal amount of the channel substrate is exposed.  
 A variety of vegetation is present with 70% of the streambank surface covered with  
 a few barren or thin areas present with fewer plant species  
 20-30% of the streambanks have bank erosional areas.  
 20-30% of the streambanks have bank erosional areas.  
 land cover near stream is forest  
 land cover near stream is forest

**Vegetation Notes:**

**TREES**

Sweet Gum  
 White Oak  
 American Holly  
 Red Maple

**SHRUBS/UNDERSTORY**

Privet

**HERBS/VINES**

Arundinaria  
 Crossvine  
 Honeysuckle  
 Christmas Fern

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** UT to Kenneth Creek at Academy St

**Date:** 1/21/2003

**Point of Assessment:** 4KT19

**County:** Wake

**River Basin:** Cape Fear

**Assessor**    **Assessor**  
 J. Hutton    Greg Price

Parameter	Score	Score
Instream Cover (fish)	8	8
Epifaunal Substrate	6	6
Embeddedness	2	3
Channel Alteration	1	5
Sediment Deposition	3	3
Frequency of Riffles	7	6
Channel Flow Status	11	15
Bank Vegetative Protection		
Left Bank	1	2
Right Bank	1	2
Bank Stability		
Left Bank	1	1
Right Bank	1	1
Vegetated Buffer Zone Width		
Left Bank	5	5
Right Bank	5	5
<b>Total Score:</b>	<b>52</b>	<b>62</b>

Productive habitats expected for stream type make up <50%

Substrate is a mixture of sand and bedrock

Fine sediment and silt surrounds and fills more than 75% of the living spaces available more than 90% of the stram site has been dredged or otherwise altered.

80-90% of the bottom is affected with heavy deposition from coarse and fine gravel and sand. No pools

water fills more than 75% of the available channel

Little to no vegetative cover on the stream banks with many bare spots and rock

stream banks are unstable. Mass erosion and bank failure is evident. Erosion and pronounced undercutting is present. 70-80% of the stream bank has erosional areas

Buffer area is comprised of early successional growth on disturbed land with a few trees and shrubs

Buffer area is comprised of early successional growth on disturbed land with a few trees and shrubs

The banks are box-cut or stabilized with rip-rap or no longer have native vegetation.

Instream habitat is highly altered.

**Vegetation Notes:**

**TREES**

Tulip Poplar  
 Water Oak  
 Gum  
 Dogwood

Loblolly Pine

**SHRUBS/UNDERSTORY**

Azalea  
 Sycamore Sapplings  
 American Holly

**HERBS/VINES**

Briar  
 Ivy

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** UT to Kenneth Creek at Wade St

**Date:** 1/21/2003

**Point of Assessment:** 4KT19T1

**County:** Wake

**River Basin:** Cape Fear

**Assessor**    **Assessor**  
 J. Hutton    Greg Price

Parameter	Score	Score
Instream Cover (fish)	13	13
Epifaunal Substrate	12	11
Embeddedness	8	7
Channel Alteration	9	8
Sediment Deposition	7	4
Frequency of Riffles	16	16
Channel Flow Status	11	13
Bank Vegetative Protection		
Left Bank	4	4
Right Bank	4	4
Bank Stability		
Left Bank	4	4
Right Bank	4	4
Vegetated Buffer Zone Width		
Left Bank	5	6
Right Bank	6	7
<b>Total Score:</b>	<b>103</b>	<b>101</b>

Productive habitats make up approximately 60% of the reach. Most habitats are smothered by sand. substrate is comprised of small gravel stones and sand  
 Fine sediment and silt surround and fill 60% of the living spaces around and in between the gravel somewhat channelized. 40-80% of the area has been dredged or otherwise altered.  
 65-80% of the bottom is affected with moderate deposition in the pools.  
 water reaches the base of both lower banks and minimal amount of channel substrate is exposed.

60% of the stream bank surface is covered by vegetation, which is typically composed of scattered shrubs, grasses, and forbs. Thin or bare spots are visible and closely cropped.

60% of the banks have erosional areas. Stream banks are moderately unstable.

pasture/agriculture

### Vegetation Notes:

#### TREES

Loblolly Pine  
 White Oak  
 Gum  
 Red Maple

#### SHRUBS/UNDERSTORY

Privet

#### HERBS/VINES

Briar  
 Ivy

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** Neill's Creek AT SR1403 Harnett Central Rd

**Date:** 2/6/2003

**Point of Assessment:** 4MNM1

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
Greg Price   Marco Hilhorst

Parameter	Score	Score
Instream Cover (fish)	19	19
Epifaunal Substrate	17	19
Embeddedness	20	20
Channel Alteration	19	19
Sediment Deposition	17	18
Frequency of Riffles	19	19
Channel Flow Status	18	18
Bank Vegetative Protection		
Left Bank	8	9
Right Bank	8	8
Bank Stability		
Left Bank	9	9
Right Bank	9	9
Vegetated Buffer Zone Width		
Left Bank	10	10
Right Bank	10	10
<b>Total Score:</b>	<b>183</b>	<b>187</b>

Productive habitats make up >70% of the reach  
 mixture of gravel and sand  
 less than 10% embeddedness  
 no evidence of channel disturbance  
 less than 20% of the bottom is affected by sand or silt accumulation  
 water reaches both lower banks and a minimal amount of channel substrate is exposed  
 a variety of vegetation is present and covers 90% of the stream bank surface, some disruption is evident.  
 a variety of vegetation is present and covers 90% of the stream bank surface, some disruption is evident.  
 Banks are stable, erosion is minimal, less than 10% is affected by bank erosion  
 Banks are stable, erosion is minimal, less than 10% is affected by bank erosion  
 forested vegetative buffer zone > than 50 feet wide later successional stage.  
 forested vegetative buffer zone > than 50 feet wide later successional stage.

**Vegetation Notes:**

**TREES**

American Beech      Red Oak  
 River Birch          Loblolly Pine  
 Red Maple  
 Ironwood/Sourwood

**SHRUBS/UNDERSTORY**

American Holly  
 Privet  
 Giant Cane  
 Mountain Laurel

**HERBS/VINES**

Smilax  
 Crossvine

# Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** UT to Neill's Creek

**Date:** 7/16/2003

**Point of Assessment:** 4UNM1

**County:** Harnett

**River Basin:** Cape Fear

**Assessor**   **Assessor**  
M.Hilhorst   Marshall Wight

Parameter	Score	Score
Instream Cover (fish)	18	18
Epifaunal Substrate	17	17
Embeddedness	13	15
Channel Alteration	15	15
Sediment Deposition	17	18
Frequency of Riffles	19	19
Channel Flow Status	20	18
Bank Vegetative Protection		
Left Bank	9	10
Right Bank	9	9
Bank Stability		
Left Bank	9	8
Right Bank	9	8
Vegetated Buffer Zone Width		
Left Bank	10	10
Right Bank	10	10
<b>Total Score:</b>	175	175

Productive habitats make up >70% of the reach  
the substrate is dominated by coarse gravel with some sand and cobble  
fine sediment and silt surround and fill 40% of the living spaces around an in between the gravel  
some man-made channel disturbance has occurred, but the disturbance is more than 20 years old.  
less than 20 % of the channel is affected by sediment deposition with some accumulation in runs and pools  
Water reaches the base of both lower banks and a minimal amount of the substrate is exposed  
More than 90% of the stream bank surface is covered by native/natural vegetation.  
banks are stable. Less than 10% is affected by bank erosion  
forest  
forest

**Vegetation Notes:**

**TREES**

Water Oak                      Sweet Gum  
River Birch                      White Oak  
Flowering Dogwood  
Red Cedar

**HERBS/VINES**

Panicum  
Microstegium  
Christmas Fern

## Habitat Assessment Worksheet: Riffle/Run Prevalent Stream

**Stream:** UT to Neills Creek

**Date:** 7/30/2003

**Point of Assessment:** 4UNT13

**County:** Harnett

**River Basin:** Cape Fear

**Lat./Long. Coordinates:**

**Assessor**   **Assessor**  
 J. Elmore   Marshall Wight

Parameter	Score	Score
Instream Cover (fish)	5	5
Epifaunal Substrate	6	7
Embeddedness	18	18
Channel Alteration	3	8
Sediment Deposition	12	15
Frequency of Riffles	18	18
Channel Flow Status	18	11
Bank Vegetative Protection		
Left Bank	2	7
Right Bank	2	7
Bank Stability		
Left Bank	5	8
Right Bank	5	7
Vegetated Buffer Zone Width		
Left Bank	2	2
Right Bank	2	2
<b>Total Score:</b>	<b>98</b>	<b>115</b>

Only 2 of the 7 productive habitats are present and comprise less than 50% of the reach  
 the substrate is dominated by gravel  
 there is little to no embeddedness present by fine silt, with the exception of one pool  
 More than 90% of the stream site has been dredged or otherwise altered. Banks are box-cut.  
 20-35% of the bottom is affected by sand or silt accumulation. There is some bar formation  
 water fills 75% of the available channel, some substrate is exposed on bars  
 70% of the banks are covered with vegetation. Thin or bare spots are visible and there is closely cropped  
 vegetation with less than 1/2 the plant stubble height remaining.  
 moderately unstable banks in some locations. Medium areas of erosion or bank slumping is visible.  
 riparian vegetation and land cover is active horse pasture, consisting of planted grasses and forbs with  
 some scattered trees.

**Vegetation Notes:**

**TREES**

Black Willow  
 Cedar

**HERBS/VINES**

Fescue  
 forbs