USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream BV

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream BW

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

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South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream BX

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
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SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

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South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream BY

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

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1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

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10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
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SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

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10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 7

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

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25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
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SCORE: 9

11. Manure Presence

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10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
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> 9.0	**Excellent**

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Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream BZ

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

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10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

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10	7	3	1

SCORE: 8

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 6

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream C

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 2

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: N/A

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: N/A

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): 6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream CA

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CB

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 8

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 1

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 6

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 8

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CC

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CD

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 2

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 1

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 2

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 4

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 0

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 3

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 2.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CE

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 9

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CF

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 2

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CG

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 3

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 4

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 3

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 4

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 4

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 6

AVERAGE SCORE (TOTAL SCORE / 11): 4.2

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CH

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
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- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 5

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 6

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 5

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 6

AVERAGE SCORE (TOTAL SCORE / 11): 4.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CI

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 6

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 10

AVERAGE SCORE (TOTAL SCORE / 11): 7.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/15/2009 Stream CJ

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: _____

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CK

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CL

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 4

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CM

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 8

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 10

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CN

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 10

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 5

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CO

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
/ 10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 4

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 6

AVERAGE SCORE (TOTAL SCORE / 11): 5.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CP

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 8

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 10

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS South Carolina
Wildlife Habitat Incentives Program • October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CQ

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 4

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CR

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 3

AVERAGE SCORE (TOTAL SCORE / 11): 6.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CS

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 5

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 6

AVERAGE SCORE (TOTAL SCORE / 11): 5.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CT

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 5

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 5

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CU

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 5

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 5

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CV

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 2

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 2

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 1

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: _____

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 4

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 3

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 2

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 1

AVERAGE SCORE (TOTAL SCORE / 11): 2.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CW

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 5

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 10

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 7

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 10

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 4

AVERAGE SCORE (TOTAL SCORE / 11): 7.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/16/2009 Stream CX

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 3

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 2

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 4

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 4

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 1

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 3

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 3

AVERAGE SCORE (TOTAL SCORE / 11): 3.2

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/17/2009 Stream CY

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 10

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 10

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 10

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 9

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 8

AVERAGE SCORE (TOTAL SCORE / 11): 8.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/17/2009 Stream CZ

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream D

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 9

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 10

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: N/A

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: N/A

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): 8.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/17/2009 Stream DA

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 3

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/17/2009 Stream DB

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 5

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 9

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/17/2009 Stream DC

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 5

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 1

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 3

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 3

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 5

AVERAGE SCORE (TOTAL SCORE / 11): 3.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/17/2009 Stream DD

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/28/2009 Stream DE

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/28/2009 Stream DF

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 6

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 3

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/28/2009 Stream DG

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 3

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 2

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 3

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 4

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 5

AVERAGE SCORE (TOTAL SCORE / 11): 3.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/28/2009 Stream DH

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 8

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 7

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 4

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 1

AVERAGE SCORE (TOTAL SCORE / 11): 6.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/28/2009 Stream DI

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 6

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/29/2009 Stream DJ

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 9

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 9

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 7

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/29/2009 Stream DK

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 5

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/29/2009 Stream DL

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 9

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/29/2009 Stream DM

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 9

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 1

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream E

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 10

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 10

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 9

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 8

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 9

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): 9.2

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream F

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): 6.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream G

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): 6.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream H

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 3

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): 6.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream I

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream J

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 5

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 1

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 5.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream K

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 2

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 9

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 3

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 4.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream L

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream M

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream N

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 9

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 7

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 8

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream O

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 9

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream P

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 8

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 9

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream Q

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 8

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 9

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream R

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 3

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 5

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 6

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 4

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 7

AVERAGE SCORE (TOTAL SCORE / 11): 4.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream S

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 9

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 9

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 9

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 9

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 10

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 8

AVERAGE SCORE (TOTAL SCORE / 11): 9.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/31/2009 Stream T

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 8

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 6

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 8

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 9

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream U

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 4

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 5

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream V

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream W

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 7

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 6

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 9

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream X

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the **average width** of the stream. Circle the appropriate score or interpolate between the scores. See the considerations **below in completing** assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 4

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 8

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 6

AVERAGE SCORE (TOTAL SCORE / 11): 5.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream Y

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 5

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 8

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 6

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 6

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 8

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 4

AVERAGE SCORE (TOTAL SCORE / 11): 6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream Z

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 3

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 4

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 4

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 3

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 4

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 4

AVERAGE SCORE (TOTAL SCORE / 11): 4.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream A

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 1

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: N/A

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: N/A

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 11

AVERAGE SCORE (TOTAL SCORE / 11): 6.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, Date: 4/01/2009 Stream AA

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 7

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 6

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 5

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 9

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream AB

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 2

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 3

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 4

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 3

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 4.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/01/2009 Stream AC

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 8

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 10

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 8

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 8.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AD

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 4

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 4

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 4

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 4

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 6

AVERAGE SCORE (TOTAL SCORE / 11): 5.2

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AE

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 5

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 6

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 7

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 8

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 3

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: 8

AVERAGE SCORE (TOTAL SCORE / 11): 6.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AF

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 10

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 6

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

USDA - NRCS
Wildlife Habitat Incentives Program

South Carolina
October, 2005

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AG

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain.	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
10	7	3	1

SCORE: 7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incised.	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1

SCORE: 6

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1

SCORE: 10

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base flow elevation.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: 7

10. Canopy Cover (Use coldwater or warm water below, not both)
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream 2-3 miles generally shaded.	>50% shaded in reach; or >75% shaded in reach and 2-3 miles upstream poorly shaded.	20-50% shaded.	<20% shaded in reach.
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 7.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:
12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	**Poor**
6.1 – 7.4	**Fair**
7.5 – 8.9	**Good**
> 9.0	**Excellent**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/16/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line M
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland M

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	Tree	FACW-
2.	*Acer rubrum*	Tree	FAC
3.	*Fraxinus pennsylvanica*	Tree	FACW
4.	*Acer rubrum*	Sapling	FAC
5.	*Fraxinus pennsylvanica*	Sapling	FACW
6.	*Ilex opaca*	Sapling	FAC-
7.	*Fraxinus pennsylvanica*	Shrub	FACW
8.	*Liriodendron tulipifera*	Shrub	FAC
9.	*Sambucus canadensis*	Herbaceous	FACW-
10.	*Carex lurida*	Herbaceous	OBL
11.	*Lycopus uniflorus*	Herbaceous	OBL
12.	*Microstegium vimineum*	Herbaceous	FAC+
13.	*Onoclea sensibilis*	Herbaceous	FACW
14.			
15.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 0-2 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS (1 or more required)
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS (2 or more required)
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4"	A	10yr 4/1			Loam
4-15"+	B	10yr 5/1	10yr 6/6	Course, Common, Prominent	Loamy Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/16/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PEM
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line N
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland N

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Peltandra virginica*	Herbaceous	OBL			
2.	*Juncus effusus*	Herbaceous	FACW+			
3.	*Lemna minor*	Herbaceous	OBL			
4.	*Justicia americana*	Herbaceous	OBL			
5.						
6.						
7.						
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
FIELD OBSERVATIONS:		☐	Sediment deposits
Depth of Surface Water: 2-4 (in.)		**SECONDARY INDICATORS**	**(2 or more required)**
Depth to Free Water in Pit: 0 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Saturated Soil: 0 (in.)		☐	Water-Stained Leaves
		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4"	A	10yr 5/3			Silt, Clay
4-18"+	B	10yr 5/3	2.5yr 3/6	Fine, Many, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☒	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Soil meets the criteria for NRCS hydric soil test indicator F.19 Piedmont Flood Plain Soils. However, this indicator has not been approved as a primary indicator and cannot be used to determine whether or not a wetland is jurisdictional.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☐	No☒	Is this Sampling Point Within A Wetland?	Yes☐	No☒

Remarks: Hydric soils parameter is not met. Although area provides wetland functions it cannot be considered jurisdictional under the 1987 Delineation Manual.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/16/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PSS
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line P
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland P

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Salix nigra*	Tree	OBL
2.	*Pinus taeda*	Tree	FAC
3.	*Salix nigra*	Sapling	OBL
4.	*Acer rubrum*	Sapling	FAC
5.	*Liquidambar styracflua*	Sapling	FAC+
6.	*Acer rubrum*	Shrub	FAC
7.	*Juncus effusus*	Herbaceous	FACW+
8.	*Carex lurida*	Herbaceous	OBL

Dominant Plant Species	Stratum	Indicator

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 1-6 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Unknown

Taxonomy (Subgroup):

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	10yr 3/1			Silt, Clay
2-18"+	B	10yr 5/3	5yr 4/6	Course, Common, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☒	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☒	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Soil meets the criteria for NRCS hydric soil test indicator F.19 Piedmont Flood Plain Soils. However, the presence of iron-manganese concretions make the wetland jurisdictional. Parameter is met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐	Is this Sampling Point Within A Wetland?	Yes ☒	No ☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PSS/PEM
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line Q
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland Q

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	Sapling	FACW-			
2.	*Fraxinus pennsylvanica*	Sapling	FACW			
3.	*Juncus effusus*	Herb	FACW+			
4.	*Carex lurida*	Herb	OBL			
5.						
6.						
7.						
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 1-10 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-6"	A	7.5yr 5/4			Clay
6-18"+	B	7.5yr 5/3	2.5yr 4/8	Fine, Common, Prominent	Silty Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☒	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Soil meets the criteria for NRCS hydric soil test indicator F.19 Piedmont Flood Plain Soils. However, this indicator has not been approved as a primary indicator and cannot be used to determine whether or not a wetland is jurisdictional.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils parameter is not met. Although area provides wetland functions it cannot be considered jurisdictional under the 1987 Delineation Manual.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line R
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland R

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Liquidambar styraciflua*	Shrub	FAC+			
2.	*Fraxinus pennsylvanica*	Shrub	FACW			
3.	*Carex scoparia*	Herb	FACW			
4.						
5.						
6.						
7.						
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met. Unknown buttercup species (*Ranunculus* sp.) were observed.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 0-2 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"	B	10yr 3/1			Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met. Horizon 'A' either thin or non-existent.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line S
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland S

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Acer rubrum*	Sapling	FAC			
2.	*Carpinus caroliniana*	Sapling	FAC			
3.	*Alnus serrulata*	Shrub	FACW+			
4.	*Carpinus caroliniana*	Shrub	FAC			
5.	*Juncus effuses*	Herb	FACW+			
6.						
7.						
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 2-4 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	7.5yr 3/2	7.5yr 5/6	Few, Course, Prominent	Silt, Clay
2-18"+	B	7.5yr 3/1			Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐	Is this Sampling Point Within A Wetland?	Yes ☒	No ☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Union
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PEM
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line T
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland T

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	Shrub	FACW-			
2.	*Acorus calamus*	Herbaceous	OBL			
3.	*Iris virginica*	Herbaceous	OBL			
4.	*Polygonum persicaria*	Herbaceous	FACW			
5.	*Carex lurida*	Herbaceous	OBL			
6.						
7.						
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 0.5-1.5 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3"	A	7.5yr 4/2			Sand
3-18"+	B	7.5yr 6/2	5yr 4/6	Many, Course, Distinct	Silty Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/28/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Union
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO/PEM
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line U
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland U

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Liquidambar styraciflua*	Shrub	FAC+
2.	*Microstegium vimineum*	Herbaceous	FAC+
3.	*Boehmeria cylindrical*	Herbaceous	FACW+
4.	*Onoclea sensibilis*	Herbaceous	FACW
5.	*Campsis radicans*	Vine	FAC
6.			
7.			
8.			

Dominant Plant Species	Stratum	Indicator

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 3 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	10yr 3/3			Muck
2-11"	B	10yr 3/1			Sandy Clay
11-18"+	B2	10yr 5/3			Sand

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/28/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Union
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PEM
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line X
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland X

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Sambucus nigra*	Herb	FACW-			
2.	*Epilobium coloratum*	Herb	OBL			
3.	*Polygonum hydropiperoides*	Herb	OBL			
4.	*Leersia virginica*	Herb	FACW			
5.	*Lonicera japonica*	Herb	FAC-			
6.						
7.						
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 80%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 3-4 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-11"	A	10yr 4/1			Sand
11-18"+	B	10yr 4/2			Sand

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☒	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐	Is this Sampling Point Within A Wetland?	Yes ☒	No ☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	3/31/2009
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland B

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Pinus echinata*	Tree	UPL	9.			
2.	*Ulmus alata*	Sapling	FACU+	10.			
3.	*Vaccinium arboreum*	Shrub	FACU	11.			
4.	*Festuca rubra*	Herbaceous	FACU+	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than 50% of vegetation is FAC or wetter. Wetland parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☐	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	A	7.5yr 6/6			Silty Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameters are not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☐	No☒	Wetland Hydrology Present?	Yes☐	No☒
Hydric Soils Present?	Yes☐	No☒	Is this Sampling Point Within A Wetland?	Yes☐	No☒

Remarks: No wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/6/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland C

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Pinus taeda*	Tree	FAC	9.			
2.	*Quercus velutina*	Tree	UPL	10.			
3.	*Quercus alba*	Tree	FACU	11.			
4.	*Quercus alba*	Sapling	FACU	12.			
5.	*Juniperus virginiana*	Sapling	FACU-	13.			
6.	*Ilex opaca*	Shrub	FAC-	14.			
7.	*Vaccinium corymbosum*	Shrub	FACW	15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 29%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than 50% of vegetation is FAC or wetter. Wetland parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	A	10yr 4/3			Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: No wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/7/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland E

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus laurifolia*	Tree	FACW	9.			
2.	*Liquidambar styraciflua*	Tree	FAC+	10.			
3.	*Ulmus Americana*	Tree	FACW	11.			
4.	*Carpinus caroliniana*	Tree	FAC	12.			
5.	*Smilax rotundifolia*	Vine	FAC	13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	A	7.5yr 5/6	7.5yr 4/3	Many, Common, Distinct	Silty Loam

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not met. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	4/7/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland F

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Liriodendron tulipifera*	Tree	FAC	9.			
2.	*Juniperus virginiana*	Tree	FACU-	10.			
3.	*Liquidambar styraciflua*	Tree	FAC+	11.			
4.	*Asimina triloba*	Sapling	FAC	12.			
5.	*Juniperus virginiana*	Sapling	FACU-	13.			
6.	*Carpinus caroliniana*	Sapling	FAC	14.			
7.	*Polystichum acrostichoides*	Herb	FAC	15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 71%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Wetland parameter is met. Greater than 50% of dominant vegetation is FAC or wetter.

HYDROLOGY

RECORDED DATA (Describe in Remarks)	**PRIMARY INDICATORS**	**(1 or more required)**
☐ Stream, Lake or Tide Gage	☐	Inundated
☐ Aerial Photograph	☐	Saturated in Upper 12 Inches
☐ Other	☐	Water Marks
☐ No Recorded Data Available	☐	Drift Lines
	☐	Drainage Patterns in Wetlands
	☐	Sediment deposits
FIELD OBSERVATIONS:	**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: (in.)	☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: (in.)	☐	Water-Stained Leaves
Depth to Saturated Soil: (in.)	☐	Local Soil Survey Data
	☐	Other (Explain in Remarks)
	☐	FAC-Neutral Test

Remarks: Parameter is not met. No wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3	A	10 YR 2/2			Silty Loam
3-18+	B	5 YR 4/6			Silty Loam

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Parameter is not met. No hydric soil indicators are present.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters not met. Data collected within in an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/08/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland G

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	Tree	FACW-	9.			
2.	*Betula nigra*	Tree	FACW	10.			
3.	*Liquidambar styraciflua*	Tree	FAC+	11.			
4.	*Carpinus caroliniana*	Sapling	FAC	12.			
5.	*Cornus florida*	Sapling	FACU	13.			
6.	*Microstegium vimineum*	Herb	FAC+	14.			
7.	*Podophyllum peltatum*	Herb	FACU	15.			
8.	*Lonicera japonica*	Herb	FAC-	16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 62.5%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☐	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water:	(in.)	☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit:	(in.)	☐	Water-Stained Leaves
Depth to Saturated Soil:	(in.)	☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	A	2.5yr4/8			Clayey Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not met. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland H

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Pinus taeda*	Tree	FAC	9.			
2.	*Aesculus flava*	Sapling	UPL	10.			
3.	*Ulmus alata*	Sapling	FACU+	11.			
4.	*Lonicera japonica*	Herbaceous	FAC-	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 25%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than or equal to 50% of dominant vegetation is FAC or wetter. Wetland parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☐	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
FIELD OBSERVATIONS:		☐	Sediment deposits
Depth of Surface Water: (in.)		**SECONDARY INDICATORS**	**(2 or more required)**
Depth to Free Water in Pit: (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Saturated Soil: (in.)		☐	Water-Stained Leaves
		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3"	A	7.5yr 4/3			Silty loam
3-18"+	B	7.5yr 5/6			Sandy loam

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☐	No☒	Wetland Hydrology Present?	Yes☐	No☒
Hydric Soils Present?	Yes☐	No☒	Is this Sampling Point Within A Wetland?	Yes☐	No☒

Remarks: No wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland I

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Juniperus virginiana*	Sapling	FACU-	9.			
2.	*Pinus virginiana*	Sapling	UPL	10.			
3.	*Festuca rubra*	Herbaceous	FACU+	11.			
4.	*Trifolium pretense*	Herbaceous	FACU-	12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than or equal to 50% of dominant vegetation is FAC or wetter. Wetland parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)	**PRIMARY INDICATORS** (1 or more required)
☐ Stream, Lake or Tide Gage	☐ Inundated
☐ Aerial Photograph	☐ Saturated in Upper 12 Inches
☐ Other	☐ Water Marks
☐ No Recorded Data Available	☐ Drift Lines
	☐ Drainage Patterns in Wetlands
	☐ Sediment deposits
FIELD OBSERVATIONS:	**SECONDARY INDICATORS** (2 or more required)
Depth of Surface Water: (in.)	☐ Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: (in.)	☐ Water-Stained Leaves
Depth to Saturated Soil: (in.)	☐ Local Soil Survey Data
	☐ Other (Explain in Remarks)
	☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Unknown

Taxonomy (Subgroup):

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3"	A	5yr 3/3			Clayey Loam
3-18"+	B	7yr 5/8			Clay Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☐	No☒	Wetland Hydrology Present?	Yes☐	No☒
Hydric Soils Present?	Yes☐	No☒	Is this Sampling Point Within A Wetland?	Yes☐	No☒

Remarks: No wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland K

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Pinus virginiana*	Tree	UPL	9.			
2.	*Acer rubrum*	Sapling	FAC	10.			
3.	*Carpinus caroliniana*	Sapling	FAC	11.			
4.	*Rubus argutus*	Shrub	FACU+	12.			
5.	*Houstonia pusilla*	Shrub	FAC-	13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 40%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than or equal to 50% of dominant vegetation is FAC or wetter. Wetland parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	A	5yr 5/8			Clay, loam

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☐	No☒	Wetland Hydrology Present?	Yes☐	No☒
Hydric Soils Present?	Yes☐	No☒	Is this Sampling Point Within A Wetland?	Yes☐	No☒

Remarks: No wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland L

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Pinus taeda*	Tree	FAC	9.			
2.	*Liquidambar styraciflua*	Sapling	FAC+	10.			
3.	*Prunus serotina*	Sapling	FACU	11.			
4.	*Liquidambar styraciflua*	Shrub	FAC+	12.			
5.	*Ligustrum sinense*	Shrub	FAC	13.			
6.	*Lonicera japonica*	Vine	FAC-	14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 67%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of dominant vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	10yr 5/3			Loam
2-12"	B	7.5yr 5/8			Clay, Loam
12-18"	C	7.5yr 5/8	10yr 6/8	Few, Coarse, Faint	Clay, Loam

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not present. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	4/16/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland M

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus falcata*	Tree	FACU-	9.	*Lonicera japonica*	Vine	FAC-
2.	*Q. alba*	Tree	FACU	10.			
3.	*Cornus florida*	Sapling	FACU	11.			
4.	*Carpinus caroliniana*	Sapling	FAC	12.			
5.	*Fagus grandifolia*	Shrub	FACU	13.			
6.	*Onoclea sensibilis*	Herb	FACW	14.			
7.	*Polystichum acrostichoides*	Herb	FAC	15.			
8.	*Parthenocissus quinquefolia*	Vine	FAC	16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 46 %
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than or equal to 50% of dominant vegetation is FAC or wetter. Parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: No wetland hydrology indicators are present. Parameter is not met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18+	A	2.5 YR 4/4	7.5 YR 5/3	Fine, Common, Prominent	Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: No hydric soil indicators are present. Parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☐	No ☒	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: No wetland parameters are met. Data was collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/16/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	**Community ID:**	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland P

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Pinus taeda*	Tree	FAC			
2.	*Pinus taeda*	Sapling	FAC			
3.	*Acer rubrum*	Sapling	FAC			
4.	*Betula nigra*	Sapling	FACW			
5.	*Parthenocissus quinquefolia*	Herbaceous	FAC			
6.	*Allium sp.*	Herbaceous	FACU			
7.	*Lonicera japonica*	Herbaceous	FAC-			
8.	*Stellaria media*	Herbaceous	FACU			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 62%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of dominant vegetation is FAC or wetter. Parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☐	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water:	(in.)	☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit:	(in.)	☐	Water-Stained Leaves
Depth to Saturated Soil:	(in.)	☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	10yr 3/3			Loam
2-18"+	B	7.5yr 5/3	5yr 5/8	Fine, Common, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not met. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland R

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Acer rubrum*	Tree	FAC			
2.	*Fraxinus pennsylvanica*	Tree	FACW			
3.	*Fagus grandifolia*	Tree	FACU			
4.	*Liquidambar styraciflua*	Sapling	FAC+			
5.	*Polystichum acrostichoides*	Herb	FAC			
6.	*Lonicera japonica*	Vine	FAC-			
7.	*Stellaria media*	Herb	FACU			
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 57%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☐	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water:	(in.)	☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit:	(in.)	☐	Water-Stained Leaves
Depth to Saturated Soil:	(in.)	☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12"	A	10yr 3/2			Sand
12-18"	B	10yr 3/1			Sand

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Indicators do not meet standards for hydric soil. Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soil and wetland hydrology parameters are not met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland S

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Quercus alba*	Tree	FACU			
2.	*Fagus grandifolia*	Tree	FACU			
3.	*Liriodendron tulipifera*	Sapling	FAC			
4.	*Fagus grandifolia*	Sapling	FACU			
5.	*Rosa multiflora*	Shrub	UPL			
6.	*Pinus taeda*	Shrub	FAC			
7.	*Lonicera japonica*	Herbaceous	FAC-			
8.						

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 29%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Less than 50% of dominant vegetation is FAC or wetter. Parameter is not met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☐	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
FIELD OBSERVATIONS:		☐	Sediment deposits
Depth of Surface Water: (in.)		**SECONDARY INDICATORS**	**(2 or more required)**
Depth to Free Water in Pit: (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Saturated Soil: (in.)		☐	Water-Stained Leaves
		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3"	A	10yr 5/3			Loam
3-18"+	B	2.5yr 6/4			Clayey Sand

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Indicators do not meet standards for hydric soil. Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☐	No☒	Wetland Hydrology Present?	Yes☐	No☒
Hydric Soils Present?	Yes☐	No☒	Is this Sampling Point Within A Wetland?	Yes☐	No☒

Remarks: No wetland parameters are met. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/17/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Union
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland T

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	*Liriodendron tulipifera*	Tree	FAC			
2.	*Liquidambar styraciflua*	Tree	FAC+			
3.	*Liquidambar styraciflua*	Sapling	FAC+			
4.	*Cornus florida*	Sapling	FACU			
5.	*Liquidambar styraciflua*	Shrub	FAC+			
6.	*Ligustrum sinense*	Shrub	FAC			
7.	*Lonicera japonica*	Herbaceous	FAC-			
8.	*Rubus allegheniensis*	Herbaceous	UPL			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 62%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of dominant vegetation is FAC or wetter. Parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-11"	A	5yr 4/6			Silt, Clay
11-18"+	B	7.5yr 5/3	5yr 4/6	Fine, Common, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Indicators do not meet standards for hydric soil. Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not present. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/28/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Union
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland U

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Pinus taeda*	Tree	FAC
2.	*Platanus occidentalis*	Tree	FACW-
3.	*Liriodendron tulipifera*	Sapling	FAC
4.	*Prunus serotina*	Sapling	FACU
5.	*Prunus serotina*	Shrub	FACU
6.	*Liquidambar styraciflua*	Shrub	FAC+
7.	*Rubus argutus*	Herbaceous	FACU+
8.	*Polystichum acrostichoides*	Herbaceous	FAC

Dominant Plant Species	Stratum	Indicator
Lonicera japonica	Herbaceous	FAC-

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 55%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of dominant vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-6"	A	7.5yr 5/6			Silt, Loamy
6-18"+	B	7.5yr 5/3			Silt, Loamy

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Indicators do not meet standards for hydric soil. Wetland parameter is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not present. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/28/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Union
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	Upland
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Upland X

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Pinus taeda*	Tree	FAC
2.	*Quercus laurifolia*	Sapling	FACW
3.	*Acer rubrum*	Sapling	FAC
4.	*Juniperus virginiana*	Sapling	FACU-
5.	*Quercus laurifolia*	Shrub	FACW
6.	*Lonicera japonica*	Herbaceous	FAC-
7.	*Vitis rotundifolia*	Herbaceous	FAC
8.			

Dominant Plant Species	Stratum	Indicator

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 71%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of dominant vegetation is FAC or wetter. Parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: (in.)
Depth to Free Water in Pit: (in.)
Depth to Saturated Soil: (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☐ FAC-Neutral Test

Remarks: Parameter is not met. Wetland hydrology indicators are not present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Unknown

Taxonomy (Subgroup):

Drainage Class:

Field Observations ☐ Yes ☒ No

Confirm Mapped Type?

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-6"	A	7.5yr 4/6			Sand

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks: Indicators do not meet standards for hydric soil. Wetland parameter is not met. Refusal at 6 inches.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☐	No ☒
Hydric Soils Present?	Yes ☐	No ☒	Is this Sampling Point Within A Wetland?	Yes ☐	No ☒

Remarks: Hydric soils and wetland hydrology parameters are not met. Data collected within an upland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	4/6/2009
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PSS/PEM
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line B
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland B

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Salix discolor*	Sapling	FACW
2.	*Typha latifolia*	Herb	OBL
3.	*Juncus effusus*	Herb	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met. Unknown sedges (*Carex* sp.) were observed.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 3 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Parameter is met. Wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3"	A	10yr 4/2			Silt
3-18+	B	7.5yr 5/1	7.5yr 5/6	Course, Common, Prominent	Clay/silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Indicators meet standards for low chroma colors. Wetland parameters are met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters are met. Wetland is hydrologically isolated, and appears to be a relic borrow pit.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	4/7/2009
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line C
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland C

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Quercus laurifolia*	Tree	FACW	9.			
2.	*Ulmus americana*	Tree	FACW	10.			
3.	*Liquidambar styraciflua*	Tree	FAC+	11.			
4.	*Liquidambar styraciflua*	Sapling	FAC+	12.			
5.	*Acer rubrum*	Sapling	FAC	13.			
6.	*Polystichum acrostichoides*	Herb	FAC	14.			
7.	*Lonicera japonica*	Vine	FAC-	15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 86%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☒	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 1 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Parameter is met. Wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2"	A	2/1			Silty loam
2-7"	B	10yr 5/1	7.5yr 4/6	Fine, Common, Prominent	Clay/silt
7-18+"	C	10yr 4/1	7.5yr 3/3	Many, Common, Distinct	Clay/silt/ gravel

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Indicators meet standards for low chroma colors. Wetland parameters are met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/07/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line E
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland E

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Carpinus caroliniana*	Shrub	FAC	9.			
2.	*Viburnum dentatum*	Shrub	FAC	10.			
3.	*Carex sp.*	Herb	FACW	11.			
4.	*Galium asprellum*	Herb	FACW	12.			
5.	*Lonicera japonica*	Vine	FAC-	13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 80%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 1 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS (1 or more required)
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☒ Drift Lines
- ☒ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS (2 or more required)
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Parameter is met. Wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-5"	A	10yr 4/1			Sand

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Indicators meet standards for low chroma colors. Wetland parameters are met. Refusal at 5 inches.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/08/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line F
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland F

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	Tree	FACW-	9.	*Arundinaria gigantea*	Herb	FACW
2.	*Carpinus caroliniana*	Sapling	FAC	10.			
3.	*Acer rubrum*	Sapling	FAC	11.			
4.	*Liquidambar styraciflua*	Sapling	FAC+	12.			
5.	*Asimina triloba*	Sapling	FAC	13.			
6.	*Arisaema triphyllum*	Herb	FACW-	14.			
7.	*Polygonum persicaria*	Herb	FACW	15.			
8.	*Juncus effusus*	Herb	FACW+	16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 1-2 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Parameter is met. Wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	B	10yr 6/1	5yr 5/6	Course, Common, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☒	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Indicators meet standards for low chroma colors. Wetland parameters are met. A horizon thin to non-existent, less than 1 inch.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐	Is this Sampling Point Within A Wetland?	Yes ☒	No ☐

Remarks: All wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/08/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line G
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland G

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Platanus occidentalis*	Tree	FACW-	9.			
2.	*Betula nigra*	Tree	FACW	10.			
3.	*Liquidambar styraciflua*	Tree	FAC+	11.			
4.	*Carpinus caroliniana*	Sapling	FAC	12.			
5.	*Platanus occidentalis*	Sapling	FACW-	13.			
6.	*Ulmus americana*	Shrub	FACW	14.			
7.	*Sambucus nigra*	Herb	FACW-	15.			
8.							

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met. Unknown sedges (*Carex* sp.) observed.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☒	Drift Lines
		☒	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 2-3 (in.)		☒	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☐	FAC-Neutral Test

Remarks: Parameter is met. Wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3"	A	7.5yr 4/3			Silt, Clay
3-18"+	B	7.5yr 5/3	2.5yr 3/6	Course, Common, Distinct	Silt,Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☒	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☒	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Soil meets the criteria for NRCS hydric soil test indicator F.19 Piedmont Flood Plain Soils. Sulfidic odor used as primary indicator. Wetland parameters are met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line H
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland H

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Betula nigra*	Tree	FACW
2.	*Ulmus americana*	Sapling	FACW
3.	*Liquidambar styraciflua*	Sapling	FAC+
4.	*Acer negundo*	Sapling	FACW
5.	*Sambucus canadensis*	Herb	FACW-
6.	*Campsis radicans*	Vine	FAC
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met. Unknown sedges (*Carex* sp.) were observed.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 10-12 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS **(1 or more required)**
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☒ Drift Lines
- ☒ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS **(2 or more required)**
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Parameter is met. Wetland hydrology indicators are present.

SOILS

Map Unit Name (Series and Phrase): Unknown

Unknown

Taxonomy (Subgroup):

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18"+	B	7.5yr 5/2	5yr 5/8	Course, Common, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Indicators meet standards for low chroma colors. Wetland parameters are met. Horizon A either thin or non-existent, less than 1 inch.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters are met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PSS/ Open Water
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line I
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland I

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Alnus serrulata*	Shrub	FACW+	9.			
2.	*Salix nigra*	Shrub	OBL	10.			
3.	*Juncus effuses*	Herb	FACW+	11.			
4.	*Sambucus canadensis*	Herb	FACW-	12.			
5.	*Carex lurida*	Herb	OBL	13.			
6.	*Polygonum perscaria*	Herb	FACW	14.			
7.				15.			
8.							

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☐	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: N/A (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Fringe wetland of an open water impoundment. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Unknown

Taxonomy (Subgroup):

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18+	B	7.5 YR 4/2	2.5 YR 4/6	Fine, Common, Prominent	Clayey Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☐	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Soils impacted by clearing. Wetland parameter met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐	Is this Sampling Point Within A Wetland?	Yes ☒	No ☐

Remarks: All wetland parameters met. Wetland located within active livestock pasture and hunting area.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line J
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland J

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator
1.	*Salix nigra*	Tree	OBL
2.	*Nyssa sylvatica*	Tree	FAC
3.	*Sambucus canadensis*	Shrub	FACW-
4.	*Carex lurida*	Herb	OBL
5.	*Polygonum punctatum*	Herb	FACW+
6.	*Microstegium vimineum*	Herb	FAC+
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)
- ☐ Stream, Lake or Tide Gage
- ☐ Aerial Photograph
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: 1-5 (in.)
Depth to Free Water in Pit: 0 (in.)
Depth to Saturated Soil: 0 (in.)

PRIMARY INDICATORS (1 or more required)
- ☒ Inundated
- ☒ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Drainage Patterns in Wetlands
- ☐ Sediment deposits

SECONDARY INDICATORS (2 or more required)
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ Other (Explain in Remarks)
- ☒ FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Unknown

Taxonomy (Subgroup):

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4"	A	7.5yr 4/4			Clay, Silt
4-18"+	B	7.5yr 4/1	7.5yr 4/4	Course, Common, Distinct	Clay, Silt

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PSS
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line K
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland K

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Salix nigra*	Shrub	OBL	9.			
2.	*Juncus effusus*	Herb	FACW+	10.			
3.	*Sambucus canadensis*	Herb	FACW-	11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.							

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☒	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☒	Drainage Patterns in Wetlands
		☐	Sediment deposits
FIELD OBSERVATIONS:		**SECONDARY INDICATORS**	**(2 or more required)**
Depth of Surface Water: 2-3 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Free Water in Pit: 0 (in.)		☐	Water-Stained Leaves
Depth to Saturated Soil: 0 (in.)		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Taxonomy (Subgroup): Unknown

Drainage Class:

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-9"	A	7.5yr 4/2	5yr 5/6	Course, Few, Prominent	Clay, Loam
9-18"+	B	7.5yr 5/2	7.5yr 5/8	Fine, Common, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes ☒	No ☐	Wetland Hydrology Present?	Yes ☒	No ☐
Hydric Soils Present?	Yes ☒	No ☐	Is this Sampling Point Within A Wetland?	Yes ☒	No ☐

Remarks: All wetland parameters met.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 USACE Wetlands Delineation Manual)

Project Site:	William S. Lee III Nuclear Station Transmission Line	Date:	04/15/09
Applicant/Owner:	Duke Energy Carolinas, LLC	County:	Cherokee
Investigator:	Jason Isbanioly/Kristen Roop	State:	SC
Do normal circumstances exist on the site?	Yes☒ No☐	Community ID:	PFO
Is the site significantly disturbed (Atypical Situation)?	Yes☐ No☒	Transect ID:	Line L
Is the area a potential problem area? (if needed, explain on reverse)	Yes☐ No☒	Plot ID:	Wetland L

VEGETATION (In Order of Stratum) Note those species observed to have morphological adaptations to wetlands with an *

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1.	*Acer rubrum*	Tree	FAC	9.			
2.	*Liquidambar styracifua*	Tree	FAC+	10.			
3.	*Acer rubrum*	Sapling	FAC	11.			
4.	*Liquidambar styracifua*	Sapling	FAC+	12.			
5.	*Impatiens capensis*	Herb	FACW	13.			
6.	*Microstegium vimineum*	Herb	FAC+	14.			
7.	*Juncus effuses*	Herb	FACW+	15.			
8.							

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%
Include species noted (*) as showing morphological adaptations to wetlands.

Describe Morphological Adaptations:

Remarks: Greater than 50% of vegetation is FAC or wetter. Wetland parameter is met.

HYDROLOGY

RECORDED DATA (Describe in Remarks)		**PRIMARY INDICATORS**	**(1 or more required)**
☐	Stream, Lake or Tide Gage	☐	Inundated
☐	Aerial Photograph	☒	Saturated in Upper 12 Inches
☐	Other	☐	Water Marks
☐	No Recorded Data Available	☐	Drift Lines
		☒	Drainage Patterns in Wetlands
FIELD OBSERVATIONS:		☐	Sediment deposits
Depth of Surface Water: (in.)		**SECONDARY INDICATORS**	**(2 or more required)**
Depth to Free Water in Pit: 0 (in.)		☐	Oxidized Root Channels in Upper 12 Inches
Depth to Saturated Soil: 0 (in.)		☐	Water-Stained Leaves
		☐	Local Soil Survey Data
		☐	Other (Explain in Remarks)
		☒	FAC-Neutral Test

Remarks: Hydrological indicators are present. Parameter is met.

SOILS

Map Unit Name (Series and Phrase): Unknown

Drainage Class:

Taxonomy (Subgroup): Unknown

Field Observations Confirm Mapped Type? ☐ Yes ☒ No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Redoximorphic Features Colors (Munsell Moist)	Redoximorphic Features Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-1"	A	7.5yr 5/3			Silt, Loam
1-18"+	B	7.5yr 6/2	5yr 6/8	Coarse, Many, Prominent	Silt, Clay

Hydric Soil Indicators:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfide Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Hydric soil indicators present. Wetland parameters met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes☒	No☐	Wetland Hydrology Present?	Yes☒	No☐
Hydric Soils Present?	Yes☒	No☐	Is this Sampling Point Within A Wetland?	Yes☒	No☐

Remarks: All wetland parameters met.

APPENDIX C

VERIFICATION AND VALIDATION PACKAGE

(Not provided in NRC package)