Study Plan Name: Wetlands Mapping and Characterization **Study Plan Designation:** Terrestrial 01

Study Short Description: Map, field verify and characterize wetlands within FERC Project boundaries, bypasses, and tailwater areas.

Applicable Hydro Projects/Developments: Bridgewater Development (including Old Catawba River channel), Oxford Development, Wylie Development, Wateree Development and the Wateree River downstream of Wateree Lake including associated reservoirs, tailwaters and bypasses

Prerequisite Study Designation: None

I. Study Objective

The objectives of this botanical study are to: 1). Identify and map the wetland areas within the FERC Project boundaries and zone of operational influence; 2). Classify and characterize wetland communities including plant species composition and structure; 3). Qualify the relationship between existing wetland distribution and structure with the current operating regime; 4). Assess the effects of project-related current and any proposed hydropower operations (e.g., fluctuations and drawdowns) on the mapped wetland areas and extrapolate to the body of water in question; and 5). Provide information to assist in developing any potential protection, mitigation, and enhancement (PM&E) measures.

This study will also provide information needed to support several other relicensing studies including:

- A Project-wide vegetation cover map
- Floodplain Vegetation Assessment (Terrestrial 02)
- Great Falls Bypass Vegetation (Terrestrial 03)
- Hydrologic/Hydraulic Operations Model (Operations 01)
- Reservoir Level Study (Operations 02)
- RTE Habitat Survey (Terrestrial 04)
- Migratory Bird Survey (Terrestrial 05)

II. Basis

This wetland study will provide information on the location, areal extent, plant species composition and structure, classification and characterization, and relative condition of the existing wetland areas within the Project boundary and zone of operational influence as required by 18 CFR 4.51 (f). This information will provide the basis for evaluating potential Project effects on these resources which will be provided in Exhibit E of the License application. These items are required under NEPA and are required for license review under the Federal Power Act.

III. Geographic and Temporal Scope

This study will focus on only those wetland areas directly affected by Project operations within the Project area from the wetlands upstream (within project influence) of Lake James downstream through the Lake Wateree Development and include the downstream zone of influence associated with Lake Wateree (Wateree River through to the Congaree River confluence). The study will include those reservoir, tailwater, bypasses, and riverine areas within FERC Project boundaries and those additional areas determined to be within the zone of operational influence including the backwater areas upstream of the tributary/reservoir confluence (e.g., Linville River upstream of Lake James). The field component of this study will be conducted within the 2004 growing season between mid-April through mid-October.

IV. Summary of Existing Data

There is little specific data associated with the wetlands within the Project area. However, information sources such as the National Wetland Inventory maps (NWI), soil surveys, FEMA maps, and any existing Duke Power aerial photography will be used to locate and delineate wetland areas. Duke Power currently has Year 2000 true color, digitally orthorectified photography at a 1:10,000 scale for most of the Project.

V. Methodology

The following methods will be used to map, characterize, and analyze the wetland areas. This study will focus on all the Project developments, bypasses and riverine reaches within the FERC Project Boundary and the zone of project influence.

Task 1 – Identify the Wetland Communities within the Project Area

- Initial determination of wetland areas will be conducted through the use of existing information such as existing Duke Power information or site knowledge, NWI maps, FEMA floodplain maps, USGS 7.5 minute quadrangles, soil surveys associated with the pertinent North Carolina and South Carolina counties, and through the use of recent Duke Power aerial photography. Additional aerial photography that will be taken during a winter 2004 drawdown (at least two feet below normal pond elevation) will be acquired for this study and several similar studies. This information, and the zone of influence boundary information determined through this study and other similar studies (see Terrestrial 02), will be transferred and digitized into the Geographic Information System (GIS) and preliminary wetland maps will be prepared. It is anticipated, for this Task, that all the wetlands within a mile corridor of the project boundary or zone of operational influence will be reviewed and mapped for the purpose of capturing the extent of wetland systems and system relationships. Wetland types mapped in this study will include aquatic beds, emergent and scrub-shrub wetlands, vernal/ephemeral pools, and forested wetlands. Wetlands mapped will be classified using the U.S. Fish and Wildlife's (USFWS) wetland classification system (e.g., PEM/FO1C) (Cowardin et. al. 1979) and the NatureServe community classifications (NatureServe 2001). This GIS wetland overlay will also be incorporated into an overall habitat or cover type map detailing all the habitat areas found in the project area or influenced by the project. This overall habitat map will incorporate wildlife information gathered from the resource studies including attribute list data on representative and indicator wildlife species for each habitat type, habitat preference, and related wildlife guild (groups of species using the same habitats). An impact analysis will include a summary of existing literature, a matrix of each habitat/wildlife guild (e.g., emergent wetland wildlife guild), and a discussion on the seasonal effects of the project on each guild. The wildlife guilds include the following (see Attachment A for guild examples)**:**

    - Open Water Guild;

- Emergent Wetland Guild;
- Scrub-shrub Wetland Guild;
- Bottomland Hardwood (Piedmont) Guild;
- Bottomland Hardwood (Coastal Plain) Guild);
- Forested Wetland Guild;
- Upland Pine Forest Guild;
- Upland Mixed Forest Guild;
- Upland Hardwood Forest Guild

Task 2 –Classify and Map the Wetland Communities within the Project Area

The classification and characterization of existing wetland communities will involve several subtasks as described below. This task will assist in the identification and characterization of wetland communities.

- Based on the preliminary wetland maps, a field survey will be conducted to verify the wetland mapping within Project boundaries and the estimated zone of downstream and lateral influence (i.e., out of bank flooding). No field surveys will be conducted on wetlands outside the zone of project influence. It is estimated that approximately 25-35 percent of the aerial photographs for each development will be ground-truthed and sub-sampled. This 25 percent will include a representation (e.g., different slopes, topographic situations, communities) of all wetland types found within the Project area. This 25-35 percent sample equates to approximately 410 wetlands to be surveyed (i.e., 250 forested, 88 scrub-shrub, and 71 emergent wetlands). Aquatic bed areas will also be surveyed as they are located in the field.

- Using the preliminary wetland map prepared in Task 1, field assessments will be conducted to classify and characterize the sub-set of the wetland communities. The assessment will include percent cover estimates for herb, shrub and tree layers, identification of dominant species, documentation of hydric soils and hydrologic indicators. Information collected will follow the 1987 Corps of Engineers (USCOE) wetland delineation method (Environmental Laboratory 1987). The "routine on-site" determination method was selected as the most appropriate identification technique. Wetlands will be considered present when observations of hydrophytic vegetation, hydrology, and hydric soils indicated that the three-parameter criteria for wetland identification are met. Areas that may be atypical in make-up or situation and under normal circumstances (e.g., have only hydrology and hydric vegetation such as many reservoir wetlands) will also be included as wetlands as defined by the Corps methodology. Data forms associated with the wetland identification effort will provided for future reference. Principal wetland functions and values will also be determined using professional judgment and based on rationale associated with the North Carolina wetland value rating system (NCDENR 1995), Wetland Evaluation Technique (WET 2.0) (Adamus et. al. 1991) and the Hydrogeomorphic Classification method (Brinson 1993).

  To accomplish this task, vegetation transects and sample plots will be established in representative areas associated with the mapped wetland areas. The representative transects and associated sample sites will be determined by the Project scientists, in consultation with any interested agency representatives. The representative transects will be located in wetland areas that are both floristically and structurally diverse in an effort to gather the most information possible and to provide a comparison of cover types, elevations, topographic relationships, and assess their relationships to factors such as inundation magnitude, duration and frequency. The sample sites will be sufficient to capture differences in communities and gradients.

The vegetation transects will be located perpendicular to the river flow and/or shoreline (normal pool elevation and will start at the lowest elevation habitat (i.e., aquatic bed or shoreline) and extend upslope the full extent of the wetland within the project boundary and/or zone of lateral influence and terminate approximately 50 feet outside of wetland boundary. The number of transects and location within each representative wetland area will be determined based on the information obtained in Task 1 and will be adequate to determine the variation in wetland type, species composition and strata within each site. An Abney™ level and surveyor's stadia rod and/or GPS will be used to measure the range in elevation and overall slope of the wetlands, as well as the location, along each transect.

Two different sample plots will be used and are as follows:

1). To collect information on tree and shrub species, canopy and sub-strata cover, and tree size (dbh), a 10 meter radius circular plot will be established along the transect. The information collected, through use of a standard field form, will include percent cover by strata, dominant species, height of canopy and/or strata, elevation above shoreline, distance from edge of bank, amount of seedling reproduction/recruitment, amount of downed woody debris, amount of leaf litter, and hydrologic regime; and

2). Nested plots of four meter radius will be used for shrubs and a one meter radius plot will be used to sample the herbaceous vegetation.

Other general information gathered along the transects will include wildlife observations and sign (including a list of representative and indicator species along with the specific habitats), general health of community, evidence of erosion, and site quality conditions.

- A determination of the inundation phenology (hydroperiod), duration (percentage of time inundated), magnitude (extent or depth in which inundated), and frequency (number of inundation times per unit time) will also conducted in this task with the objective of assessing the relationship of water surface elevations for the current discharges with the observed wetland vegetation community characteristics.

Task 3 – Determination of Project Effects

The objective of this task is to evaluate and provide an understanding of the effects of the current and any reasonable future water regimes due to Project operations on the wetland areas. This task will be accomplished through the review of Task 2 information, and the review of water level fluctuation and drawdown information (e.g., hydrographs). A 20-year period 1983-2003 will be used to provide information on the historical wet, normal and dry operating conditions. 12-month period graphs will be prepared for the typical wet, normal and dry years and related to any wetland impacts. Historic and current conditions and their associated mechanisms and factors that distinguish the existing wetland communities will be discussed. The effects of current and any alternative Project operations on the distribution, composition and general health of wetland resources will then be evaluated based on the water level information (i.e., fluctuation, drawdown, and flooding) and through use of spatial analysis using GIS overlay maps, contours and other relevant information. Cross-sections will also be prepared for each of the transects depicting the normal pool elevation, maximum/minimum drawdown levels, distance along the transect, vegetation relative abundance, and substrate types. The elevational cross-sections at the representative transects will be used as a predictive model that relates water level, duration, seasonality (timing) to the specific wetland types. For instance, the aquatic bed and the emergent wetlands are more likely to be affected by operational fluctuations. Slopes and elevation data will also be used to calculate any lakewide habitat losses (acreage) associated with incremental decreases in lake elevation (i.e., how much wetland is exposed and at what frequency, magnitude, duration, rate of change, and during what season). The impact analysis will be presented in both graphic and tabular form.

Task 4 - Prepare Technical Report

A Draft and Final technical report will be prepared for this Project that includes the following elements:

a) Project Introduction and Background
b) Study areas;
c) Methodology;
d) Discussion and Analysis
e) Results (includes impact discussion)
f) Location maps, GIS analysis and photos;
g) Any agency correspondence and or consultation;
h) Literature citations

VI. Schedules and Required Conditions

The schedule, timeline and required conditions for this project area as follows:

- Task 1 Identify and Delineate the Wetland Communities — Spring 2004
- Task 2 Classify and Characterize Wetland Communities — Spring-Fall 2004*
- Task 3 Determination of Project Effects — Fall 2004
- Task 4 Prepare Technical Report — Fall/Winter 2004 and Winter 2005

VII. Use of Study Results

This study and associated results will provide both quantitative and qualitative information that will be important in defining existing conditions as well as providing any information on potential Project impacts as they related to preparation of the License Application and specifically Exhibit E. The technical report will provide sufficient information for development and incorporation into any associated NEPA documentation. The wetland location and characterization information associated with the Project can also be used as a basis for any future PM&E discussions. Information gathered in this study will also be used to update SMP maps.

VIII. List of Participants

	Name	Organization	Phone #	E-Mail
Applicant Lead	Jay Wylie	Devine Tarbell & Associates	704 342 7376	Jay.Wylie@devinetarbell.com
Agency Leads	Mark Cantrell Chris Goudreau Chris McGrath Ron Ahle	USFWS-NC NCWRC NCWRC SCDNR	828 258 3939 828 652 4360 828 683 0671 803 734 2728	Mark_a_cantrell@fws.gov goudrecj@wnclink.com Mcgrathc1@mindspring.com RonA@scdnr.state.sc.us
Supporting Consultants	Scott T. Fletcher Gene Vaughan L.L. Gaddy Michael Wolf	Devine Tarbell & Associates Duke Power Terra Incognita Water Oak Consulting	704 342 7380 704 875 5240 803 765 9976 704 844 6750	Scott. Fletcher@Devinetarbell.com gevaugha@duke-energy.com llgaddy@bellsouth.net **mwolfe@carolina.rr.com**
Other Participants				

IX. List of Attachments

Attachment A: Example Wildlife Guilds

X. List of References

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ATTACHMENT A

EXAMPLE WILDLIFE GUILDS FOR USE IN IMPACT ANALYSIS

CATAWBA-WATEREE TERRESTRIAL WILDLIFE SPECIES GUILDS WITH SEASONALITY OF HABITAT USE

BOTTOMLAND HARDWOOD FLOODPLAIN WETLANDS (PIEDMONT)

Known from study area? (x)	Relative Abundance	Seasonal use of Habitat	Scientific Name	Common Name	Habitat Requirements / Notes	Example Potential Project Impacts
x	c	Sp Su F W	*Odocoileus virginianus*	White-tailed Deer	White-tailed deer are at home in many of the natural communities of the region. Prime habitat is broken areas of re-generating forest with cropland interspersed throughout.	Increased recreational use of the project area by humans (i.e. access for hunting) has the potential to affect this species negatively causing them to seek other suitable area with less human activity.
x	c	Sp Su F W	*Procyon lotor*	Raccoon	Associated with wetland habitats and stream corridors.	High water events have the potential to reduce the available suitable habitat for this species impacting food and den site availability.
x	c	Sp Su F W	*Castor canadensis*	Beaver	Typically found along small wooded streams which it dams to form small impoundments called beaver ponds. Also found in large rivers and lakes where it often forms bank dens as opposed to open water lodges when it forms an impoundment of its own.	Extremely low water events have the potential to de-water bank den sites. This could expose this species to additional predation lowering population levels.
x	c	Sp Su F W	*Sciurus carolinensis*	Gray Squirrel	The preferred habitat of gray squirrels is extensive tracts of mature forests of oaks, hickories, and beeches mixed with other hardwoods and various species of conifers.	High water events during the winter months could potentially inundate stored food sources causing increased mortality rates and lowered reproductive success.

x	c	Sp Su F	*Eptesicus fuscus*	Big Brown Bat	This species is normally a forest dweller, but it does not hesitate to utilize attics and crevices in buildings, caves, and crevices in rocks for daytime retreats. Favorite roosts are under the loose bark of dead trees and in cavities of trees. These bats emerge rather early in the evening and feed among the trees, often following a regular route from one treetop to another and back again.	Extremely dry years could lower water levels within the project area causing lower production of preferred food sources forcing this species to abandon roost sites within the project area and relocate to areas with better food sources.
x	c	Sp Su F W	*Scalopus aquaticus*	Eastern Mole	Eastern moles prefer moist, sandy, or loamy soil. They occur in meadows, gardens, cultivated fields, river bottoms, mountain slopes, and forests.	High water events have the potential to inundate the tunnel system and nests of this species forcing relocation to higher ground outside the project boundary within suitable soil types.
	u	Sp Su F W	*Blarina carolinensis*	Southern Short-tailed Shrew	Short-tailed shrews occur in forested areas and their associated meadows and openings. Adequate cover and food appear to be more important in determining their presence than type of soil or vegetation.	High water events have the potential to inundate the tunnel system and nests of this species forcing relocation to higher ground outside the project boundary.
	u	Sp Su F W	*Sorex longirostris*	Southeastern Shrew	The Southeastern Shrew prefers floodplain forests and the borders of swamps. It has also been found in dry upland locations, including fields and pastures.	High water events have the potential to inundate the tunnel system used by this species forcing relocation to higher ground outside the project boundary.
x	c	Sp Su F W	*Didelphis virginiana*	Virginia Opossum	The species is present in a wide variety of habitats from relatively dry upland areas to those of considerable wetness, but it prefers wooded bottomlands near streams, ponds, swamps, and other sources of water.	Increased recreational use of the project area by humans (i.e. access for hunting) has the potential to affect this species negatively causing them to seek other suitable area with less human activity.
x	c	W	*Anas platyrhynchos*	Mallard	Typically found in marshes, rivers, lakes, wooded swamps and bays with shallow water where it is able to dabble	High water events can inundate food sources necessary for this dabbling duck; Low water (de-watering) events can cause food sources to be dried out.
x	c	Sp Su F W	*Aix sponsa*	Wood Duck	This species is typically found in wooded swamps, rivers and ponds.	Low water events can cause the necessary bottomland hardwood forests that are usually flooded providing suitable habitat to be dry; This can also concentrate birds on the remaining

						suitable habitat exposing larger concentrations of birds to predators.
x	c	Sp Su F W	*Scolopax minor*	American Woodcock	This species is found in damp woods or older thickets, with moist soil where earthworms are easily found. It prefers areas with woody vegetation for singing grounds, and feeding areas with cover or near forest edges as opposed to large, open areas. They nest in a variety of habitats such as open fields, mixed forests, bushfields, and coniferous forests. It is a forest-dwelling shorebird, and is less aquatic than most of its relatives, though it still often frequents bottomlands and wet meadows.	The flooding of foraging habitat (i.e. damp areas with earthworms present) as well as nesting habitat through extreme water level fluctuations can cause negative stress for this migratory game bird.
x	c	Sp Su F W	*Meleagris gallopavo*	Wild Turkey	This is a species of woods, especially hardwood forests, and wooded swamps.	High water events can have a potential negative impact on this species by inundating favored food sources such as seeds, nuts, acorns, buds, and berries; especially during the fall.
x	c	Sp Su F W	*Buteo lineatus*	Red-shouldered Hawk	This species is typically found in woodlands, wooded rivers, and timbered swamps.	This raptor can be negatively impacted by the project in an indirect way; by impacting its prey including small mammals, the largest of these being rabbits and squirrels as well as reptiles, such as snakes, amphibians, including toads, frogs and lizards, small birds and large insects.
x	c	Sp Su F W	*Strix varia*	Barred Owl	This species is typically found in woodlands, wooded river bottoms, and wooded swamps.	This raptor can be negatively impacted by the project in an indirect way; by impacting its prey including meadow voles its main prey, followed by shrews and deer mice. Other mammals include rats, squirrels, young rabbits, bats, moles, opossums, mink, and weasels. Birds are taken occasionally, including woodpeckers, grouse, quail, jays, blackbirds, and pigeons. They also eat small fish, turtles, frogs, snakes, lizards, crayfish, beetles, crickets, and grasshoppers. The project could potentially negatively affect all of these species thereby affecting the barred owl.
x	u	Sp Su F	*Caprimulgus carolinensis*	Chuck-Will's-Widow	This species is typically found in pine foresees, river woodlands, and wooded groves.	This species could be negatively impacted by the project through water fluctuations affecting insect populations, its main food source.

x	c	Sp Su F	*Prothonotaria citrina*	Prothonotary Warbler	This species inhabits wooded swamps, flooded bottomlands, riparian corridors along rivers.	This species could be negatively impacted by the project through water fluctuations affecting insect populations, its main food source.
x	c	Sp Su F W	*Nerodia sipedon sipedon*	Northern Water Snake	This species of snake is at home in almost any aquatic habitat including swamps, marshes, bogs, streams, ponds, lakes and their adjacent habitats.	The northern water snake would most likely be impacted by the project in an indirect way: through lowering populations of prey species due to water fluctuations affecting those species breeding habitats (frogs, salamanders, insects, crayfish, and small mammals).
	u	Sp Su F W	*Eurycea guttolineata*	Three-lined Salamander	Usually found in swamps, wet ditches, and seepages along springs, and in forested floodplains throughout all of North Carolina.	The project has the potentially negatively affect on this species through de-watering the breeding and larval-stage habitats causing lower reproductive success and increased mortality.
x	c	Sp Su F W	*Rana palustris*	Pickerel Frog	Pickerel frogs commonly inhabit cool, wooded streams, seeps and springs although they are also found in many other habitats. In the South, it can also be found in the relatively warm, turbid waters of floodplain swamps. These frogs tend to wander far into grassy fields or into weed-covered areas in the summer.	The project has the potentially negatively affect on this species through de-watering the breeding habitat (permanent and semi-permanent pools) causing lower reproductive success.

CATAWBA-WATEREE TERRESTRIAL WILDLIFE SPECIES GUILDS
WITH SEASONALITY OF HABITAT USE

EMERGENT WETLANDS

Known from study area? (x)	Relative Abundance	Seasonal use of Habitat	Scientific Name	Common Name	Habitat Requirements / Notes	Example Potential Project Impacts
x	c	Sp Su F W	*Mustela vison*	Mink	Never far from water (Semi-aquatic); has associated with most types of wetlands.	The dewatering of wetland habitats would reduce the total available usable habitat in the project area; thereby reducing the total number of individuals.
x	c	Sp Su F W	*Procyon lotor*	Raccoon	Associated with wetland habitats and stream corridors.	Extremely high flows have the potential to reduce the available den sites and food sources; lowering reproductive success.
x	c	Sp Su F W	*Ondatra zibethicus*	Muskrat	Emergent wetlands dominated by rushes and cattails as well as open water areas.	Extreme flows (high or low) have the potential to reduce the available den sites and food sources; lowering reproductive success.
	r	Sp Su F W	*Sylviligus palustris*	Marsh Rabbit	Typically found in marshes and swamps as well as wooded floodplains.	High flows have the potential to inundate the preferred habitat (including food and nesting sites) of this species; lowering reproductive success.
x	c	W	*Anas crecca*	Green-winged Teal	Typically found in marshes, rivers and bays with shallow water where it is able to dabble.	The project has the potential to increase hunting opportunities (an access issue); thereby increasing mortality rates. Low water levels in the project have the potential to de-water the normally

						shallow water areas needed by this species for feeding causing negative impacts.
x	c	W	*Anas platyrhynchos*	Mallard	Typically found in marshes, rivers, lakes, wooded swamps and bays with shallow water where it is able to dabble	High water events can inundate food sources necessary for this dabbling duck; Low water (de-watering) events can cause food sources to be dried out.
x	c	W	*Anas strepera*	Gadwall	Typically found in marshes, lakes and ponds with shallow water where it is able to dabble like other 'marsh ducks'.	High water events can inundate food sources necessary for this dabbling duck; Low water (de-watering) events can cause food sources to be dried out.
x	c	Sp Su F W	*Ardea herodias*	Great Blue Heron	Associated with marshes, swamps, shores and tideflats as well as bottomland hardwood forests for nesting.	Low water levels in the project have the potential to de-water the normally shallow water areas needed by this species for feeding causing negative impacts.
x	u	W	*Circus cyaneus*	Northern Harrier	Marshes, fields and other open areas suitable for hunting techniques.	High water events or flooding can negatively affect this species indirectly by causing lower population levels in some prey species especially in small mammals; causing this species to relocate to areas with better hunting opportunities.
x	u	W	*Cistothorus palustris*	Marsh Wren	Cattail and bulrush (both brackish and freshwater) marshes.	Prolonged low water events have the potential to reduce the available wintering habitat within the project area; causing this species to relocate to other areas with high quality preferred habitat available.
x	c	Sp Su F	*Dendroica petechia*	Yellow Warbler	Breeds in marshes, wet deciduous emergent thickets, swamp edges,	Prolonged low water events have potential to reduce the available foraging habitat.
x	c	Sp Su F W	*Agelaius phoeniceus*	Red-winged Blackbird	Breeds in marshes, brushy swamps, hayfields; forages also in cultivated land, along edges of water.	Prolonged low water events have the potential to reduce the available habitat within the project area; causing this species to relocate to other areas with high quality preferred habitat available.
x	u	Sp Su F W	*Kinosternon subrubrum*	Eastern Mud Turtle	Prefers shallow water within marshes, wet meadows, ponds as well as ditches. Has a strong tolerance for brackish water.	High water events have the potential to negatively affect this species by deeply inundating its favored habitat– it prefers shallow water areas for its optimum habitat – forcing it to seek additional areas.
	r	Sp Su F W	*Trachemys scripta elegans*	Red-eared Slider	Prefers quiet water with a muddy bottom and a profusion of vegetation. Often basks on logs and masses of vegetation.	Extremely high flows have the potential to scour this species favored habitat; forcing it to seek additional areas with muddy bottoms and emergent vegetation.

x	u	Sp Su F W	*Nerodia fasciata fasciata*	Banded Water Snake	Found in all types of freshwater habitats, including streams, ponds, lakes and marshes	Very dry years causing low or no water to be available in this species preferred habitat could potentially reduce its prey species; lowering reproductive success or forcing individuals to find alternative living locations.
x	u	Sp Su F W	*Seminatrix pygaea*	Black Swamp Snake	Often found in emergent wetlands where hyacinths are common and plentiful.	Dry years with low water events could cause the preferred habitat of this species, areas where water hyacinths abound, to be degraded; causing individuals to seek alternative living locations.
x	c	Sp Su F W	*Notophthalmus viridescens viridescens*	Red-spotted Newt	Often found in ponds, small lakes, marshes or other permanent or semi-permanent bodies of unpolluted water.	Extreme water events, both high and low, have the potential to affect this species. Low water events could dry out breeding and/or resting areas, and high water events could scour away egg masses lowering reproductive success.
x	r	Sp Su F W	*Pseudotriton montanus montanus*	Eastern Mud Salamander	Occurs in the muddy environs of springs, muddy seeps along small streams, etc. Will often escape predators by burrowing into muck or taking refuge in crayfish burrows or other holes.	Extremely high flows have the potential to scour this species favored habitat; forcing it to seek additional areas with muddy bottoms.
x	u	Sp Su F W	*Hyla cinerea*	Green Treefrog	Habitats include swamps, borders of lakes and streams, floating vegetation, or almost any place well supplied with water or dampness.	Extreme water events, both high and low, have the potential to affect this species. Low water events could dry out breeding and/or resting areas, and high water events could scour away egg masses lowering reproductive success.
x	c	Sp Su F W	*Rana catesbeiana*	Bullfrog	Aquatic and preferring larger bodies of water than most other frogs. A resident of lakes, ponds, bogs, sluggish portions of streams; usually seen at waters edge or amidst vegetation or snags among which it can hide from predators.	The project has a potentially negatively affect on this species through de-watering the breeding habitat (permanent and semi-permanent pools) causing lower reproductive success.