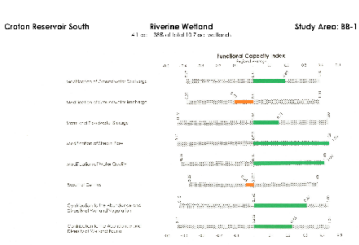
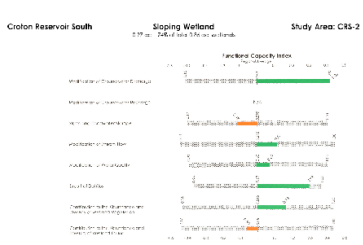
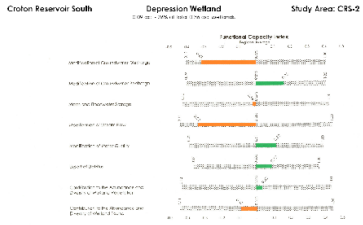
# Town of Yorktown, New York

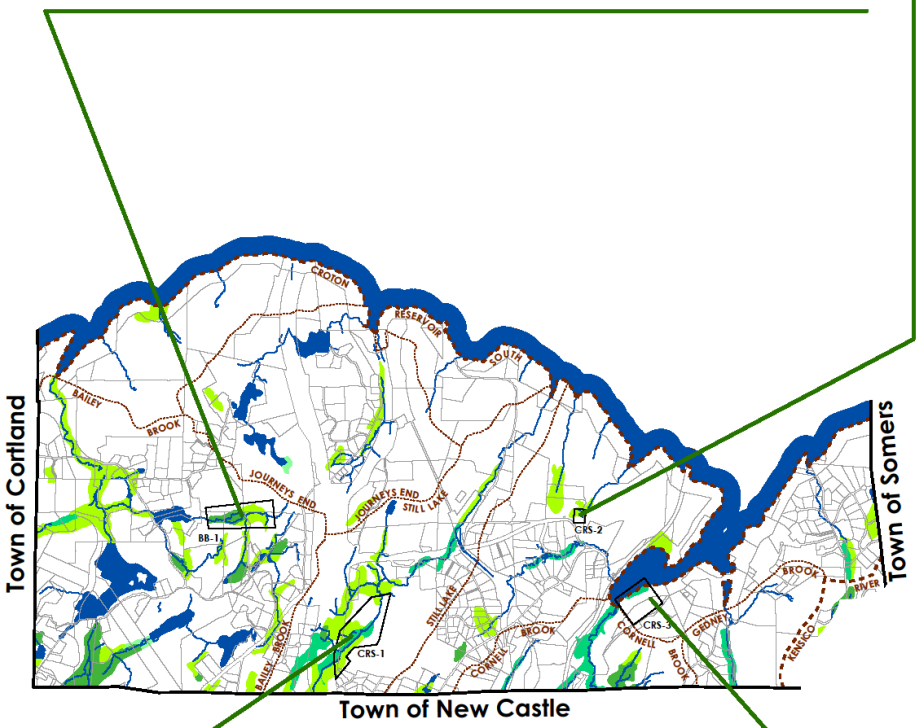
## Wetland Functional Assessment Study

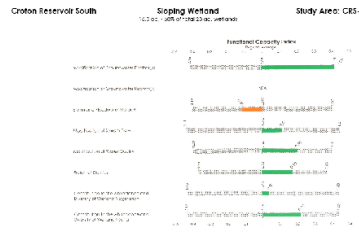
## Croton Reservoir South Watershed

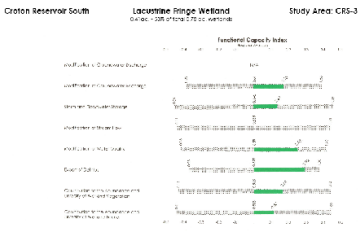



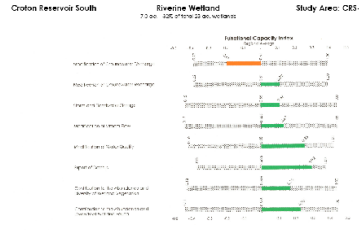



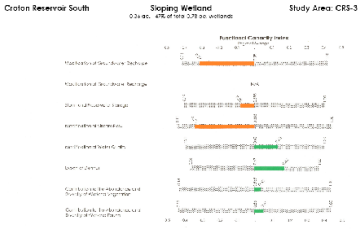



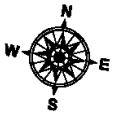




**Legend**

Wetlands by Hydrogeomorphic Type

- Depression
- Lacustrine
- Riverine
- Slope

- Waterbody
- Watercourses
- Watershed
- Sub-Watershed
- Tax Lots
- Study Areas




1,600 0 1,600 3,200 4,800 6,400 8,000 Feet

1 inch = 1,600 feet


Prepared By:

Environmental Design Consulting

As part of the Freshwater Wetlands Functional Assessment Study, 2007.

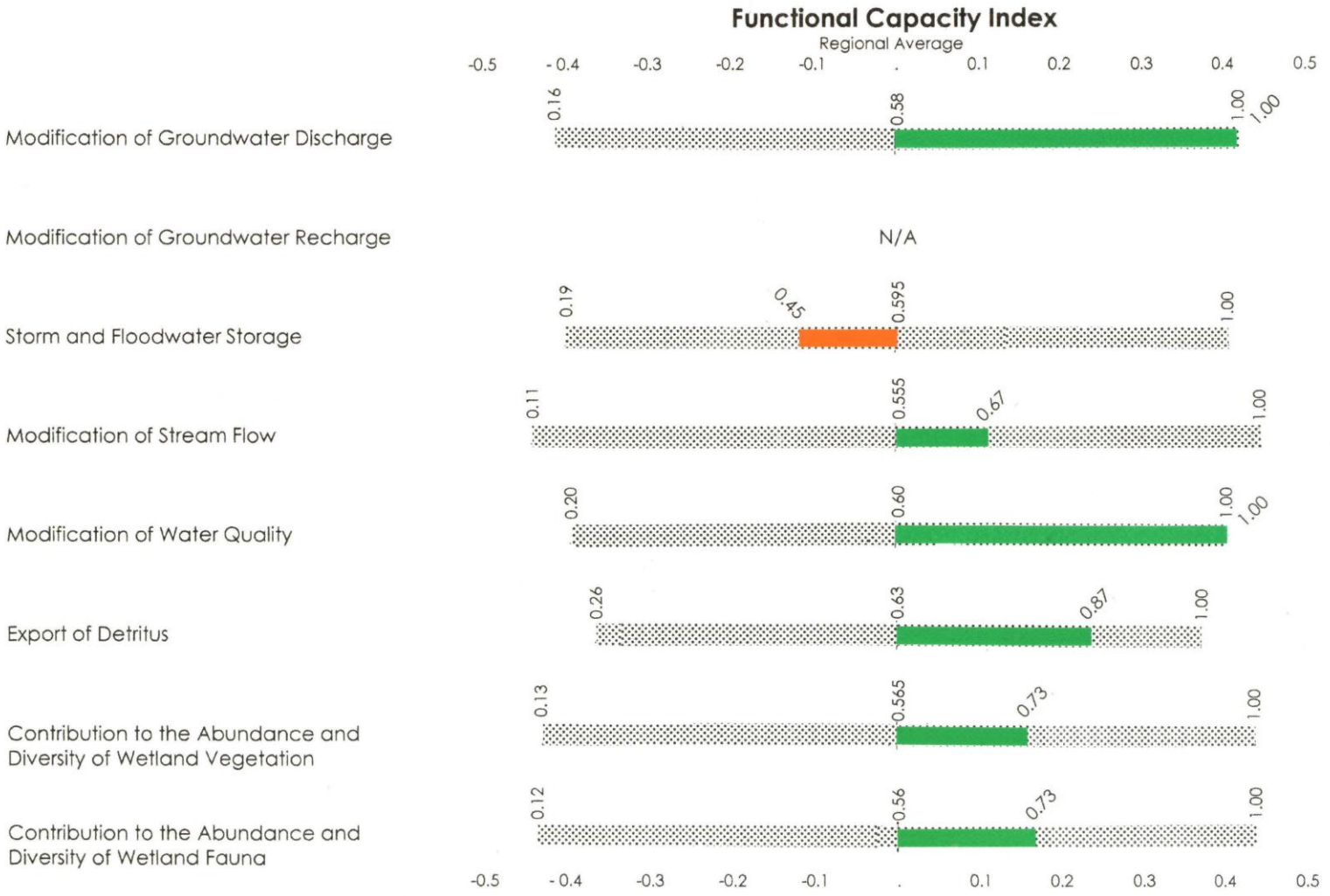
Additional GIS map production assistance provided by:

**JAM GIS CONSULTING**

**JAIME A. MARTINEZ - 718-501-8332**

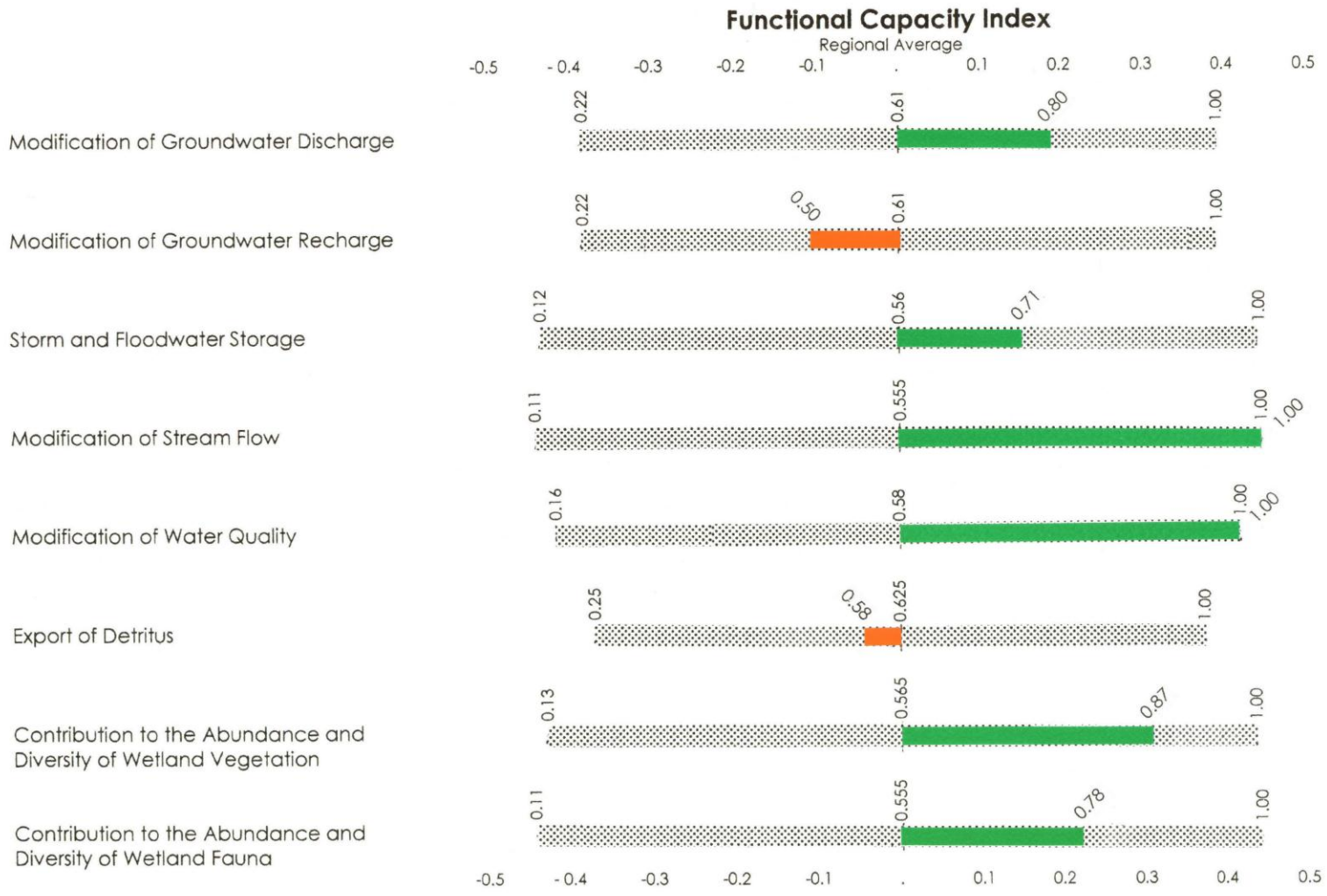
**Croton Reservoir South** **Sloping Wetland** **Study Area: BB-1**

5.0 ac. - 47% of total 10.7 ac. wetlands



**Croton Reservoir South** **Riverine Wetland** **Study Area: BB-2**

4.1 ac. - 38% of total 10.7 ac. wetlands



# WETLAND INVENTORY DATA

DEPRESSION
SLOPE
BOTH

Project Number: YORKTOWN  Date:

Wetland Number: BB-1

Aerial Photo Numbers:

USGS Quadrangle: Ossining

Field Investigators: BP & SC

## PART 1 - CHARACTERIZATION of WETLAND

### SURFACE WATER FLOW VECTORS

| Condition | Percent/Acreage | |
|---|---|---|
| | 15 | Depressional |
| | 47 | Slope |
| | | Flat |
| | | Extensive Peatland |
| | | Lacustrine Fringe |
| | 38 | Riverine |

### VEGETATION TYPES

| Type | Percent/Acreage |
|---|---|
| Forested Wetland | |
| Evergreen Needle-leaved | 1% |
| Deciduous Broad-leaved | 85 |
| Needle-leaved | |
| Scrub Shrub | |
| Evergreen Broad-leaved | |
| Needle-leaved | |
| Deciduous Broad-leaved | 14% |
| Needle-leaved | |
| Emergent Wetland | |
| Persistent | |
| Non-persistent | |
| Aquatic Bed | |
| Total | 100% |

### SOIL TYPES

Histosol
- Fibric ☐
- Hemic ☐
- Sapric ☐

Mineral Hydric Soil
- Gravelly ☐
- Sandy ☐
- Silty ☐
- Clayey ☐

### GEOLOGY

Surficial: Glacial till

Bedrock:

Comments:

### PLANT SPECIES

| | OW | FW | F | FU | OU | DOM | COM | OCC | C | S | TS | LS | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Red Maple | | | | | | ■ | | | ■ | | | | |
| Sweet Birch | | | | | | | | ■ | ■ | | | | |
| Shagbark Hickory | | | | | | | | ■ | ■ | | | | |
| Tulip Poplar | | | | | | | | ■ | ■ | | | | |
| Red Oak | | | | | | | | ■ | ■ | | | | |
| American Beech | | | | | | | | ■ | ■ | | | | |
| American Elm | | | | | | | | ■ | ■ | | | | |
| Basswood | | | | | | | | ■ | ■ | | | | |
| Spicebush | | | | | | | | ■ | | | ■ | | |
| Witchhazel | | | | | | | | | | | ■ | | |
| Silky Dogwood | | | | | | | ■ | ■ | | | ■ | | |
| Winged Euonymus | | | | | | | | ■ | | | ■ | | |
| Japanese Barberry | | | | | | | | ■ | | | ■ | | |
| Arrowwood Viburnum | | | | | | | ■ | | | | ■ | | |
| Maple-leaf Viburnum | | | | | | | | ■ | | | ■ | | |
| Garlic Mustard | | | | | | | | ■ | | | | | ■ |
| Tussock Sedge | | | | | | | ■ | ■ | | | | | ■ |
| Skunk Cabbage | | | | | | | ■ | ■ | | | | | ■ |
| Pennsylvania Sedge | | | | | | | ■ | | | | | | ■ |
| Poison Ivy | | | | | | | ■ | | | | | | ■ |
| Pussy Willow | | | | | | | ■ | ■ | | | ■ | | |

| | | | |
|---|---|---|---|
| OW | Obligate Wetland | COM | Common |
| FW | Facultative Wetland | OCC | Occasional |
| F | Facultative | C | Canopy |
| FU | Facultative Upland | S | Sapling |
| OU | Obligate Upland | TS | Tall Shrub |
| DOM | Dominant | LS | Low Shrub |
| | | H | Herb |

### PRE-EMPTIVE STATUS

- ___ Public ownership
- ___ Wildlife management area
- ___ Fisheries management area
- ___ Designated State or Federal protected wetland
- ___ Documented habitat for state or federal listed species
- ___ Regionally scarce wetland category
- ___ Historic/archaeologic area

# WETLAND INVENTORY DATA (continued)

## PART 2 - CHARACTERIZATION of MODEL VARIABLES

### LANDSCAPE VARIABLES

**Size:**
- ☐ Small (<10 acres)
- ☐ Medium (10-100 acres)
- ☐ Large (>100 acres)

**Wetland Juxtaposition:**
- ☐ Connected Upstream and Downstream
- ☐ Only Connected Above
- ☐ Only Connected Below
- ☐ Other Wetlands Nearby but not Connected
- ☐ Wetland Isolated

**Fire Occurence and Frequency:**
- ☐ Natural; Predictable Frequency
- ☐ Natural; Sporadic Frequency
- ☐ Human-caused; Predictable
- ☐ Human-caused; Sporadic
- ☐ Rare Event
- ☐ No Evidence

**Regional Scarcity:**
- ☐ Not Scarce (>5% of total wetland area of region)
- ☐ Scarce (<5% of total wetland area of region)

**Watershed Land Use:**
- ☐ > 50% urbanized
- ☐ 25-50% urbanized
- ☐ 0-25% urbanized

### HYDROLOGIC VARIABLES

**Surface Water Level Fluctuation of Wetland:**
- ☐ High Fluctuation
- ☐ Low Fluctuation
- ☐ Never Inundated

**Frequency of Overbank Flooding:**
- ☐ Return Interval > 5 yrs.
- ☐ Return Interval 2-5 yrs.
- ☐ Return Interval 1-2 yrs.
- ☐ No Overbank Flooding

**pH:**
- ☐ Acid <5.5
- ☐ Circumneutral 5.5-7.4
- ☐ Alkaline >7.4
- ☐ No Water

**Surficial Geologic Deposit Under Wetland**
- ☐ Low Permeability Stratified Deposits
- ☐ High Permeability Stratified Deposits
- ☐ Glacial Till

**Wetland Land Use:**
- ☐ High Intensity (ie. agriculture)
- ☐ Moderate Intensity (ie. forestry)
- ☐ Low Intensity (ie. open space)

**Wetland Water Regime:**
- ☐ Wet: Perm Flooded, Intermittently Exposed, Semiperm. Flooded
- ☐ Drier: Seasonally Flooded, Temporarily Flooded, Saturated

**Basin Topographic Gradient:**
- ☐ High Gradient >2%
- ☐ Low Gradient <2%

**Degree of Outlet Restriction:**
- ☐ Restricted Outflow
- ☐ Unrestricted Outflow
- ☐ No Outflow

**Ratio of Wetland Area to Watershed Area:**
- ☐ High >10%
- ☐ Low <10%

**Microrelief of Wetland Surface:**
- ☐ Pronounced >45 cm
- ☐ Well Developed 15-45 cm
- ☐ Poorly Developed <15 cm
- ☐ Absent

**Inlet/Outlet Class:**
- ☐ No Inlet/No Outlet
- ☐ No Inlet/Intermittent Outlet
- ☐ No Inlet/Perennial Outlet
- ☐ Intermittent Inlet/No Outlet
- ☐ Intermittent Inlet/Intermittent Outlet
- ☐ Intermittent Outlet/Perennial Outlet
- ☐ Perennial Inlet/No Outlet
- ☐ Perennial Inlet/ Intermittent Outlet
- ☐ Perennial Inlet/Perennial Outlet

**Nested Piezometer Data:**
- ☐ Recharge
- ☐ Discharge
- ☐ Horizontal Flow
- ☐ Not Available

**Relationship of Wetlands' Substrate Elevation to Regional Piezometric Surface:**
- ☐ Piez. Surface Above or at Substrate elev.
- ☐ Piez. Surface below Substrate elev.
- ☐ Not Available

**Evidence of Sedimentation:**
- ☐ No Evidence Observed
- ☐ Sediment Observed on Wetland Substrate
- ☐ Fluvaquent Soils

**Evidence of Seeps and Springs:**
- ☐ No Seeps or Springs
- ☐ Seeps Observed
- ☐ Perennial Spring
- ☐ Intermittent Spring

### SOIL VARIABLES

**Soil Lacking:**
- ☐

**Histosol:**
- ☐ Fibric
- ☐ Hemic
- ☐ Sapric

**Mineral Hydric Soil:**
- ☐ Gravelly
- ☐ Sandy
- ☐ Silty
- ☐ Clayey

### VEGETATION VARIABLES

**Vegetation Lacking:**
- ☐

**Dominant Wetland Type:**
- ☐ Forested - Evergreen - Needle-leaved
- ☐ Forested - Deciduous - Broad-leaved
- ☐ Forested - Deciduous - Needle-leaved
- ☐ Scrub Shrub - Evergreen - Broad-leaved
- ☐ Scrub Shrub - Evergreen - Needle-leaved
- ☐ Scrub Shrub - Deciduous - Broad-leaved
- ☐ Scrub Shrub - Deciduous - Needle-leaved
- ☐ Emergent - Persistent
- ☐ Emergent - Non-persistent
- ☐ Aquatic Bed

**Number of Types & Relative Proportions:**

| Number of Types | Evenness of Distribution |
|---|---|
| ☐ Actual # | ☐ Even Distribution |
| ☐ 5 | ☐ Moderately Even Distribution |
| ☐ 4 | ☐ Highly Uneven Distribution |
| ☐ 3 | |
| ☐ 2 | |
| ☐ 1 | |

**Vegetation Density/Dominance:**
- ☐ Sparse (0-20%)
- ☐ Low Density (20-40%)
- ☐ Medium Density (40-60%)
- ☐ High Density (60-80%)
- ☐ Very High Density (80-100%)

**Vegetative Interspersion:**
- ☐ High (small groupings, diverse and interspersed)
- ☐ Moderate (broken irregular rings)
- ☐ Low (large patches, concentric rings)

**Number of Layers and Percent Cover:**

| Number of Layers | % Cover |
|---|---|
| ☐ 6 or > (actual #) | 1. submergents: |
| ☐ 5 | 2. floating: |
| ☐ 4 | 3. moss-lichen: |
| ☐ 3 | 4. short herb: |
| ☐ 2 | 5. tall herb: |
| ☐ 1 | 6. dwarf shrub: |
| | 7. short shrub: |
| | 8. tall shrub: |
| | 9. sapling: |
| | 10. tree: |

**Plant Species Diversity:**
- ☐ Low 1-2 plots sampled
- ☐ Medium 3-4 plots sampled
- ☐ High 5 or more plots sampled

**Proportion of Animal Food Plants:**
- ☐ Low (5-25% cover)
- ☐ Medium (25-50% cover)
- ☐ High (>50% cover)

**Cover Distribution:**
- ☐ Continuous Cover
- ☐ Small Scattered Patches
- ☐ 1 or More Large Patches; Parts of Site Open
- ☐ Solitary, Scattered Stems

**Dead Woody Material:**
- ☐ Abundant (>50 of wetland surface)
- ☐ Moderately Abundant (25-50% of surface)
- ☐ Low Abundance (0-25% of surface)

**Interspersion of Cover and Open Water:**
- ☐ 26-75% Scattered or Peripheral
- ☐ >75% Scattered or Peripheral
- ☐ <25% Scattered or Peripheral
- ☐ 100% Cover or Open Water

**Stream Sinuosity:**
- ☐ Highly Convoluted (index 1.50 or >)
- ☐ Moderately Convoluted (index 1.25-1.50)
- ☐ Straight/Slightly Irreg. (index) 1.10-1.25

**Presence of Islands:**
- ☐ Several to Many
- ☐ One or Few
- ☐ Absent

BB-1 Total Wetlands 10.7 ac = 5% WS.
Slope 5.0 ac = 47%
Riverine 4.1 ac = 38%
Depression 1.6 ac = 15%*
*HGM TYPES ≤ 25% not evaluated separately

## 2.9.1 Modification of Ground Water Discharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | |
| • Inlet/Outlet Class | • perennial inlet/no outlet | 0 | 0 | 0 | 0 |
| • Nested Piezometer Data | • recharge condition | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezo-metric Surface | • wetland substrate elevation above piezometric surface | 0 | 0 | 0 | 0 |
| Direct Indicators of Function | | | | | |
| • Presence of Springs and Seeps | • evidence of perennial seeps or springs | 18 | 15 | 15 | 18 |
| • Nested Piezometer Data | • discharge condition | 18 | 15 | 15 | 18 |
| • Relationship to Regional Peizometeric Surface | • wetland substrate elevation below piezometric surface | 18 | 15 | 15 | 18 |
| • Inlet/Outlet Class | • no inlet/perennial outlet | 18 | 15 | 15 | 18 |
| Primary Variables | | | | | |
| • Microrelief of Wetland Surface | • pronounced | 3 | 3 | 3 | 3 |
| | • well developed | 2 | 2 | 2 | 2 |
| | • poorly developed | 1 | 1 | 1 | 1 |
| | • absent | 0 | 0 | 0 | 0 |
| • Inlet/Outlet Class | • perennial inlet/perennial outlet | 3 | 3 | 0 | 3 |
| | • intermittent inlet/perennial outlet | 2 | 2 | 0 | 2 |
| | • all other classes | 0 | 0 | 0 | 0 |
| • pH | • alkaline | 3 | 3 | 3 | 3 |
| | • circumneutral | 2 | 2 | 2 | 2 |
| | • acid | 0 | 0 | 0 | 0 |
| | • no water present | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • high permeability stratified deposits | 3 | 3 | 3 | 3 |
| | • low permeability stratified deposits | 2 | 2 | 2 | 2 |
| | • glacial till | 1 | 1 | 1 | 1 |
| • Wetland Water Regime | • wet; permanently flooded, intermittently exposed, semipermanently flooded | 3 | 0 | 3 | 3 |
| | • drier; seasonally flooded, temporarily flooded, saturated | 1 | 0 | 1 | 1 |

(continued)

## 2.9.1 Modification of Ground Water Discharge (Continued)

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| • Soil Type | • histosol | 3 | 3 | 3 | 3 |
| | • mineral hydric soil | 1 | 1 | 1 | 1 |
| | | — | — | — | — |
| | Total Score: | | | 12 | |
| | Model Range: | 3-18 | 2-15 | 3-15 | 3-18 |
| | Functional Capacity Index: | Total Score / 18 | / 15 | / 15 | / 18 |
| | Index Range: | 0.19-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model can be applied to both year long and seasonal discharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a discharge mode for roughly half the year.

## 2.9.2 Modification of Ground Water Recharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | | |
| • Inlet/Outlet Class | • no inlet/perennial outlet; intermittent inlet/perennial outlet | 0 | | | | 0 |
| • Nested Piezometer Data | • discharge condition | 0 | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezometric Surface | • wetland substrate elevation above or at piezometric surface | 0 | 0 | 0 | 0 | 0 |
| • Presence of Seeps and Springs | • presence of seeps or springs | 0 | 0 | 0 | 0 | 0 |

(continued)

## 2.9.2 Modification of Ground Water Recharge (Continued)

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|---|
| Direct Indicators of Function | | | | | | | |
| • Inlet/Outlet Class | • | perennial inlet/no outlet | 21 | | | | 21 |
| • Nested Piezometer Data | • | recharge condition | 21 | | | | 21 |
| • Relationship to Regional Peizometeric Surface | • | wetland substrate elevation below piezometric surface | 21 | | | | 21 |
| Primary Variables | | | | | | | |
| • Microrelief of Wetland Surface | • | Poorly Developed | 3 | 3 | 1 | 3 | 3 |
| | • | Absent | 3 | 3 | 1 | 3 | 3 |
| | • | Well Developed | 2 | 2 | 2 | 2 | 2 |
| | • | Pronounced | 1 | 1 | 3 | 1 | 1 |
| • Inlet/Outlet Class | • | Perennial Inlet/Intermittent Outlet | 3 | 0 | 0 | 0 | 3 |
| | • | All Other Classes | 0 | 0 | 0 | 0 | 0 |
| • pH | • | Acid | 3 | 3 | 3 | 3 | 3 |
| | • | Circumneutral | 2 | 2 | 2 | 2 | 2 |
| | • | Alkaline | 1 | 1 | 1 | 1 | 1 |
| | • | No water present | 0 | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • | Glacial Till | 3 | 1 | 1 | 1 | 3 |
| | • | Low Permeability Stratified Deposits | 2 | 2 | 2 | 2 | 2 |
| | • | High Permeability Stratified Deposits | 1 | 3 | 3 | 3 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • | High Fluctuation | 3 | 3 | 0 | 3 | 3 |
| | • | Low Fluctuation | 2 | 2 | 0 | 2 | 2 |
| | • | Never Inundated | 1 | 1 | 0 | 1 | 1 |
| • Wetland Water Regime | • | Drier: Seasonally Flooded, Temporarily Flooded, Saturated | 3 | 3 | 0 | 3 | 3 |
| | • | Wet: Permanently Flooded, Intermittently Exposed, Semipermanently Flooded | 1 | 1 | 0 | 1 | 1 |
| | | | — | — | — | — | — |
| • Soil Type | • | Gravelly or Sandy Mineral Hydric | 3 | 3 | 0 | 3 | 3 |
| | • | Silty or Clayey Mineral Hydric | 2 | 2 | 0 | 2 | 2 |
| | • | Sapric Histosol | 1 | 1 | 0 | 1 | 1 |
| | • | Fibric or Hemic Histosol | 0 | 0 | 3 | 0 | 0 |
| | | Total Score: | | | | | |
| | | Model Range: | 4-21 | 4-18 | 2-12 | 4-18 | 4-21 |
| | | Functional Capacity Index: | Total Score / 21 | / 18 | / 12 | / 18 | / 21 |
| | | Index Range: | 0.19-1.0 | 0.22-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model should be applied to both year long and seasonal recharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a recharge mode for roughly half the year.

## 2.9.3 Storm and Flood-Water Storage

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | no outlet | | 27 | 21 | | | | 30 |
| Primary Variables | | | | | | | | |
| • Inlet/Outlet Class | • perennial inlet/intermittent outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent inlet/intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • no inlet/intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • non inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • intermittent inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • perennial inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Degree of Outlet Restriction | • restricted | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • unrestricted | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Basin Topographic Gradient | • low gradient | | 3 | 3 | 0 | 3 | 3 | 3 |
| | • high gradient | | 1 | 1 | 0 | 0 | 1 | 1 |
| • Wetland Water Regime | • Drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • Wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • high fluctuation | | 3 | 0 | 3 | 0 | 3 | 3 |
| | • low fluctuation | | 2 | 0 | 2 | 0 | 2 | 2 |
| | • never inundated | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Ratio of Wetland Area to Watershed Area | • large | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • small | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Microrelief of Wetland Surface | • pronounced | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • well developed | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • poorly developed | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Frequency of Overbank Flooding | • overbank flooding absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | • return interval of >5 yrs | | 0 | 0 | 1 | 0 | 1 | 1 |
| | • return interval of 2-5 yrs | | 0 | 0 | 2 | 0 | 2 | 2 |
| | • return interval of 1-2 yrs | | 0 | 0 | 3 | 0 | 3 | 3 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |

(continued)

## 2.9.3 Storm and Flood-Water Storage (Continued)

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| • Dead Woody Material | • abundant | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderately abundant | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | — | — | — | — | — | — |
| | | Total Score: | | | | | | |
| | | Model Range: | 4-27 | 4-21 | 2-21 | 0-12 | 3-24 | 4-30 |
| | | Functional Capacity Index: | Total Score / | / | / | / | / | / |
| | | | 27 | 21 | 21 | 12 | 24 | 30 |
| | | Index Range: | 0.15-1.0 | 0.19-1.0 | 0.09-1.0 | 0-1.0 | 0.12-1.0 | 0.13-1.0 |

## 2.9.4 Modification of Stream Flow

(This model is identical for all HGM types)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Indicators of Disfunction | no outlet | 0 |
| Direct Indicators of Function | none | |

Primary Variables

Storm and Flood Water Storage Function Model Score

| | | |
|---|---|---|
| High* | 3 | x |
| Mod | 2 | x |
| Low | 1 | x |
| High | 3 | x |
| Mod | 2 | x |
| Low | 1 | x |
| High | 3 | x |
| Mod | 2 | x |
| Low | 1 | x |

Modification of Groundwater Discharge Function Model Score

| | | | |
|---|---|---|---|
| High | 3 | = | 9 |
| High | 3 | = | 6 |
| High | 3 | = | 3 |
| Mod | 2 | = | 6 |
| Mod | 2 | = | 4 |
| Mod | 2 | = | 2 |
| Low | 1 | = | 3 |
| Low | 1 | = | 2 |
| Low | 1 | = | 1 |

Total Score:

Model Range: 1-9

Functional Capacity Index: Total Score / 9

Index Range: 0.11-1.0

*High = FCI of 0.67-1.0, Mod = FCI of 0.34-0.66, Low = FCI of 0-0.33 for the Storm and Flood Water Storage and Modification of Ground Water Discharge Function Model Scores.

## 2.9.5 Modification of Water Quality

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | evidence of sedimentation | | 18 | 15 | 12 | 12 | 12 | 18 |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • low intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • restricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • no outlet | | 2 | 0 | 0 | 0 | 0 | 2 |
| | • unrestricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Type | • no outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Dominant Wetland Type | • forested wetland | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • scrub-shrub | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • emergent wetland | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • aquatic bed | | 1 | 0 | 0 | 0 | 0 | 0 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Cover Distribution | • forming a continuous cover | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • growing in small scattered patches | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • one or more large patches | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • solitary scattered stems | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • histosol or clayey soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • silty soil | | 2 | 2 | 2 | 0 | 2 | 2 |
| | • sandy or gravelly soil | | 1 | 1 | 1 | 0 | 1 | 1 |
| | | Total Score: | ___ | ___ | ___ | ___ | ___ | ___ |
| | | Model Range: | 4-18 | 3-15 | 2-12 | 1-12 | 2-12 | 4-18 |
| | | Functional Capacity Index: | Total Score / 18 | ___ / 15 | ___ / 12 | ___ / 12 | ___ / 12 | ___ / 18 |
| | | Index Range: | 0.22-1.0 | 0.20-1.0 | 0.16-1.0 | 0.8-1.0 | 0.16-1.0 | 0.22-1.0 |

## 2.9.6 Export of Detritus

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | no outlet | | 0 | 0 | | 0 | | 0 |
| Direct Indicators of Function | none | | | | | | | |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • moderate intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • low intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • unrestricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • restricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Class | • perennial outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Wetland Water Regime | • drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • medium | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • mineral hydric soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • histosol | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Total Score: | 11 | 13 | — | — | 7 | — |
| | | Model Range: | 5-18 | 4-15 | 3-12 | 2-10 | 3-12 | 5-18 |
| | | Functional Capacity Index: Total Score | 18 | 15 | 12 | 10 | 12 | 18 |
| | | Index Range: | 0.27-1.0 | 0.26-1.0 | 0.25-1.0 | 0.20-1.0 | 0.25-1.0 | 0.27-1.0 |

## 2.9.7 Contribution to Abundance and Diversity of Wetland Vegetation

(This model is identical for all HGM types)

| VARIABLES | | CONDITIONS | WEIGHTS |
|---|---|---|---|
| Indicators of Disfunction | | no vegetation | 0 |
| Direct Indicators of Function | | none | |
| Primary Variables | | | |
| • | Plant Species Diversity | • high diversity<br>• medium diversity<br>• low diversity | 5<br>3<br>1 |
| • | Vegetation Density/Dominance | • high/very high<br>• medium<br>• sparse/low | 5<br>3<br>1 |
| • | Wetland Juxtaposition | • connected upstream and downstream<br>• connected above or below<br>• other wetlands nearby but not connected (400 m or closer)<br>• isolated | 5<br>3<br>1<br>0 |
| | | Total Score: | 13 |
| | | Model Range: | 2-15 |
| | | Functional Capacity Index: | = Total Score / 15 |
| | | Index Range: | 0.13-1.0 |

2.9.8 Contribution to Abundance and Diversity of Wetland Fauna
(This model is identical for all HGM types except Slope Wetlands for which "Interspersion of Vegetation Cover and Open Water" does not apply))

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Direct Indicators of Disfunction | none | |
| Direct Indicators of Function | none | |
| Primary Variables<br>• Watershed Land Use | • low intensity (0-25% urbanized)<br>• moderate intensity (25-50% urbanized)<br>• high intensity (>50% urbanized) | 3<br>2<br>1 |
| • Wetland Land Use | • low intensity<br>• moderate intensity<br>• high intensity | 3<br>2<br>1 |
| • Wetland Water Regime | • wet: permanently flooded, intermittently exposed, semipermanently flooded<br>• drier: seasonally flooded, temporarily flooded, saturated | 3<br>1 |
| • Microrelief of Wetland Surface | • pronounced<br>• well developed<br>• poorly developed<br>• absent | 3<br>2<br>1<br>0 |
| • Number of Wetland types and Relative Proportions | • 5 or more types<br>• 3-4 types<br>• 1-2 types<br>• no vegetation | 3<br>2<br>1<br>0 |
| | • even distribution<br>• moderately even distribution<br>• highly uneven distribution<br>• no vegetation | 3<br>2<br>1<br>0 |
| • Vegetation Interspersion | • high interspersion<br>• moderate interspersion<br>• low interspersion<br>• no vegetation | 3<br>2<br>1<br>0 |
| • Number of Layers and Percent Cover | • 5 or more layers<br>• 3-4 layers<br>• 1-2 layers<br>• no vegetation | 3<br>2<br>1<br>0 |
| | • layers well developed (>50% cover)<br>• layers with moderate cover (26-50% cover)<br>• layers poorly distinguishable (<25% cover)<br>• no vegetation | 3<br>2<br>1<br>0<br>0 |

(continued)

## 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna (Continued)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| • Interspersion of Vegetation Cover and Open Water | • 26-75% scattered or peripheral | 3 |
| | • >75% scattered or peripheral | 2 |
| | • <25% scattered or peripheral | 1 |
| | • 100% cover or open water | 1 |
| | • no vegetation | 0 |
| • Size | • large (>100 acres) | 3 |
| | • medium (10-100 acres) | 2 |
| | • small (<10 acres) | 1 |
| • Wetland Juxtaposition | • other wetlands within 400 m and connected above or below | 3 |
| | • other wetlands within 400 m but not connected | 1 |
| | • wetland isolated | 0 |

17

25 30

Slope Wetlands:

Model Range: 4-33

Functional Capacity Index = $\frac{\text{Total Score}}{33}$ 24 = 0.73

Index Range: 0.12-1.0

All Other HGM Types:

Total Score: 25

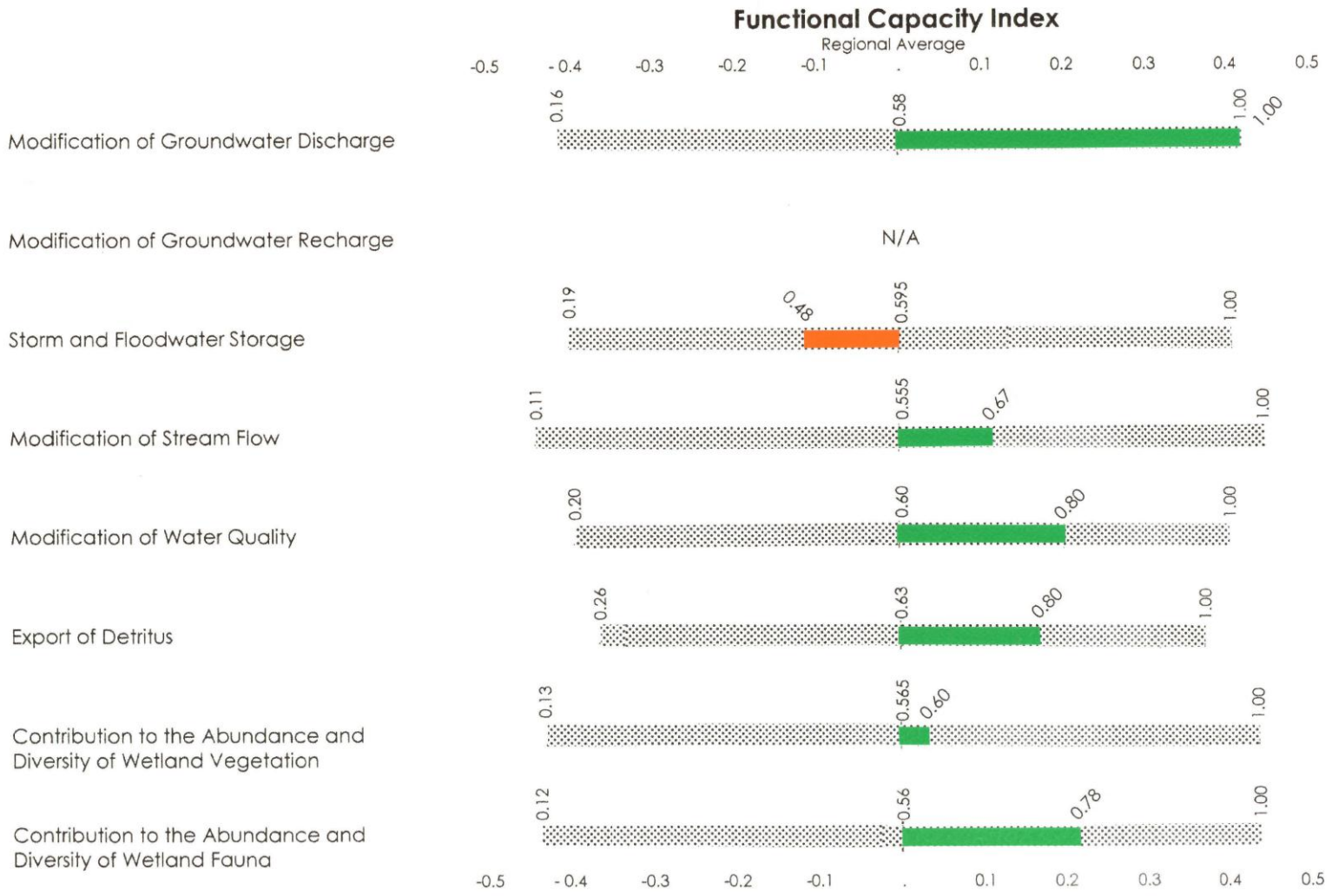
Model Range: 4-36

Functional Capacity Index = $\frac{\text{Total Score}}{36}$ 25 = 0.78

Index Range 0.11-1.0

**Croton Reservoir South** **Sloping Wetland** **Study Area: CRS-1**

16.0 ac. - 68% of total 23 ac. wetlands



**Croton Reservoir South** **Riverine Wetland** **Study Area: CRS-1**

7.0 ac. - 32% of total 23 ac. wetlands

# WETLAND INVENTORY DATA

SLOPE 16 ac 68%
RIVERINE 7 ac 32%
DEPRESSION 0.15 ac <1%*
Total Wetland 23 ac

* WETLAND CLASSES < 25% NOT EVALUATED SEPARATELY

Project Number: YORKTOWN
Wetland Number: CRS-1
Aerial Photo Numbers:
USGS Quadrangle: OSSINING
Field Investigators: BD.
Date:

## PART 1 - CHARACTERIZATION of WETLAND

### SURFACE WATER FLOW VECTORS

| Condition | Percent/Acreage | |
|---|---|---|
| | <1% | Depressional |
| | 68% | Slope |
| | | Flat |
| | | Extensive Peatland |
| | | Lacustrine Fringe |
| | 32% | Riverine |

### VEGETATION TYPES

| Type | Percent/Acreage |
|---|---|
| Forested Wetland | |
| Evergreen | |
| Needle-leaved | |
| Deciduous | |
| Broad-leaved | 90% |
| Needle-leaved | |
| Scrub Shrub | |
| Evergreen | |
| Broad-leaved | |
| Needle-leaved | |
| Deciduous | |
| Broad-leaved | 5% |
| Needle-leaved | |
| Emergent Wetland | |
| Persistent | 5% |
| Non-persistent | |
| Aquatic Bed | |
| Total | 100% |

### SOIL TYPES

Histosol
- Fibric ☐
- Hemic ☐
- Sapric ☐

Mineral Hydric Soil
- Gravelly ☐
- Sandy ☒
- Silty ☐
- Clayey ☐

### GEOLOGY

Surficial: Glacial till

Bedrock:

Comments:

### PLANT SPECIES

| | OW | FW | F | FU | OU | DOM | COM | OCC | C | S | TS | LS | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Red Maple | | | | | | ■ | | | ■ | | | | |
| American Elm | | | | | | ■ | | | ■ | | | | |
| Tulip Poplar | | | | | | ■ | | | ■ | | | | |
| River Birch | | | | | | ■ | | | ■ | | | | |
| Green Ash | | | | | | ■ | | | ■ | | | | |
| White Ash | | | | | | ■ | | | ■ | | | | |
| Witchhazel | | | | | | ■ | | | | ■ | | | |
| Briar | | | | | | | | | | | ■ | | |
| Grape spp | | | | | | | | | | | ■ | | |
| Silky Dogwood | | | | | | | | | | | ■ | | |
| Japanese Honeysuckle | | | | | | | | | | | ■ | | |
| Shadbush Serviceberry | | | | | | | | | | | ■ | | |
| Blackhaw Viburnum | | | | | | | | | | | ■ | | |
| Sweet Birch | | | | | | ■ | | | ■ | | | | |
| Japanese Rose | | | | | | | | | | | ■ | | |
| Bittersweet | | | | | | | | | | | ■ | | |
| White Oak | | | | | | | | | ■ | | | | |
| Hornbeam | | | | | | ■ | | | | | ■ | | |
| Highbush Blueberry | | | | | | | | | | | ■ | | |
| Red Oak | | | | | | | | | ■ | | | | |
| Sugar Maple | | | | | | | | | ■ | | | | |
| American Beech | | | | | | | | | ■ | | | | |
| White Pine | | | | | | | | | ■ | | | | |
| Christmas Fern | | | | | | | | | | | | | ■ |
| Mustard Garlic | | | | | | | | | | | | | ■ |
| Spicebush | | | | | | ■ | | | | | ■ | | |
| Arrowwood Viburnum | | | | | | ■ | | | | | ■ | | |
| Butternut Hickory | | | | | | | | | ■ | | | | |
| Winterberry | | | | | | ■ | | | | | ■ | | |
| Phragmites | | | | | | ■ | | | | | | | ■ |

| | | | |
|---|---|---|---|
| OW | Obligate Wetland | COM | Common |
| FW | Facultative Wetland | OCC | Occasional |
| F | Facultative | C | Canopy |
| FU | Facultative Upland | S | Sapling |
| OU | Obligate Upland | TS | Tall Shrub |
| DOM | Dominant | LS | Low Shrub |
| | | H | Herb |

### PRE-EMPTIVE STATUS

| | |
|---|---|
| ____ Public ownership | ____ Documented habitat for state or federal listed species |
| ____ Wildlife management area | ____ Regionally scarce wetland category |
| ____ Fisheries management area | ____ Historic/archaeologic area |
| ____ Designated State or Federal protected wetland | |

# WETLAND INVENTORY DATA (continued)

## PART 2 - CHARACTERIZATION of MODEL VARIABLES

### LANDSCAPE VARIABLES

**Size:**
- ☐ Small (<10 acres)
- ☒ Medium (10-100 acres)
- ☐ Large (>100 acres)

**Wetland Juxtaposition:**
- ☒ Connected Upstream and Downstream
- ☐ Only Connected Above
- ☒ Only Connected Below
- ☐ Other Wetlands Nearby but not Connected
- ☐ Wetland Isolated

**Fire Occurence and Frequency:**
- ☐ Natural; Predictable Frequency
- ☐ Natural; Sporadic Frequency
- ☐ Human-caused; Predictable
- ☐ Human-caused; Sporadic
- ☐ Rare Event
- ☒ No Evidence

**Regional Scarcity:**
- ☒ Not Scarce (>5% of total wetland area of region)
- ☒ Scarce (<5% of total wetland area of region)

**Watershed Land Use:**
- ☐ > 50% urbanized
- ☐ 25-50% urbanized
- ☒ 0-25% urbanized

### HYDROLOGIC VARIABLES

**Surface Water Level Fluctuation of Wetland:**
- ☐ High Fluctuation
- ☒ Low Fluctuation
- ☒ Never Inundated

**Frequency of Overbank Flooding:**
- ☐ Return Interval > 5 yrs.
- ☐ Return Interval 2-5 yrs.
- ☒ Return Interval 1-2 yrs.
- ☒ No Overbank Flooding

**pH:**
- ☐ Acid <5.5
- ☒ Circumneutral 5.5-7.4
- ☐ Alkaline >7.4
- ☐ No Water

**Surficial Geologic Deposit Under Wetland**
- ☐ Low Permeability Stratified Deposits
- ☐ High Permeability Stratified Deposits
- ☒ Glacial Till

**Wetland Land Use:**
- ☐ High Intensity (ie. agriculture)
- ☐ Moderate Intensity (ie. forestry)
- ☒ Low Intensity (ie. open space)

**Wetland Water Regime:**
- ☒ Wet: Perm Flooded, Intermittently Exposed, Semiperm. Flooded
- ☒ Drier: Seasonally Flooded, Temporarily Flooded, Saturated

**Basin Topographic Gradient:**
- ☒ High Gradient >2%
- ☐ Low Gradient <2%

**Degree of Outlet Restriction:**
- ☐ Restricted Outflow
- ☒ Unrestricted Outflow
- ☐ No Outflow

**Ratio of Wetland Area to Watershed Area:**
- ☐ High >10%
- ☒ Low <10%

**Microrelief of Wetland Surface:**
- ☐ Pronounced >45 cm
- ☒ Well Developed 15-45 cm
- ☐ Poorly Developed <15 cm
- ☒ Absent

**Inlet/Outlet Class:**
- ☐ No Inlet/No Outlet
- ☒ No Inlet/Intermittent Outlet
- ☐ No Inlet/Perennial Outlet
- ☐ Intermittent Inlet/No Outlet
- ☐ Intermittent Inlet/Intermittent Outlet
- ☐ Intermittent Outlet/Perennial Outlet
- ☐ Perennial Inlet/No Outlet
- ☐ Perennial Inlet/ Intermittent Outlet
- ☒ Perennial Inlet/Perennial Outlet

**Nested Piezometer Data:**
- ☐ Recharge
- ☐ Discharge
- ☐ Horizontal Flow
- ☒ Not Available

**Relationship of Wetlands' Substrate Elevation to Regional Piezometric Surface:**
- ☐ Piez. Surface Above or at Substrate elev.
- ☐ Piez. Surface below Substrate elev.
- ☒ Not Available

**Evidence of Sedimentation:**
- ☒ No Evidence Observed
- ☐ Sediment Observed on Wetland Substrate
- ☒ Fluvaquent Soils

**Evidence of Seeps and Springs:**
- ☒ No Seeps or Springs
- ☒ Seeps Observed
- ☐ Perennial Spring
- ☐ Intermittent Spring

### SOIL VARIABLES

**Soil Lacking:**
- ☐

**Histosol:**
- ☐ Fibric
- ☐ Hemic
- ☐ Sapric

**Mineral Hydric Soil:**
- ☐ Gravelly
- ☒ Sandy
- ☐ Silty
- ☐ Clayey

### VEGETATION VARIABLES

**Vegetation Lacking:**
- ☐

**Dominant Wetland Type:**
- ☐ Forested - Evergreen - Needle-leaved
- ☒ Forested - Deciduous - Broad-leaved
- ☐ Forested - Deciduous - Needle-leaved
- ☐ Scrub Shrub - Evergreen - Broad-leaved
- ☐ Scrub Shrub - Evergreen - Needle-leaved
- ☐ Scrub Shrub - Deciduous - Broad-leaved
- ☐ Scrub Shrub - Deciduous - Needle-leaved
- ☐ Emergent - Persistent
- ☐ Emergent - Non-persistent
- ☐ Aquatic Bed

**Number of Types & Relative Proportions:**

Number of Types
- ☐ Actual #
- ☐ 5
- ☐ 4
- ☒ 3
- ☒ 2
- ☐ 1

Evenness of Distribution
- ☐ Even Distribution
- ☒ Moderately Even Distribution
- ☐ Highly Uneven Distribution

**Vegetation Density/Dominance:**
- ☐ Sparse (0-20%)
- ☐ Low Density (20-40%)
- ☐ Medium Density (40-60%)
- ☒ High Density (60-80%)
- ☐ Very High Density (80-100%)

**Vegetative Interspersion:**
- ☒ High (small groupings, diverse and interspersed)
- ☐ Moderate (broken irregular rings)
- ☐ Low (large patches, concentric rings)

**Number of Layers and Percent Cover:**

Number of Layers
- ☒ 6 or > (actual #)
- ☐ 5
- ☐ 4
- ☐ 3
- ☐ 2
- ☐ 1

% Cover
1. submergents:
2. floating:
3. moss-lichen:
4. short herb:
5. tall herb:
6. dwarf shrub:
7. short shrub:
8. tall shrub:
9. sapling:
10. tree:

**Plant Species Diversity:**
- ☐ Low 1-2 plots sampled
- ☒ Medium 3-4 plots sampled
- ☐ High 5 or more plots sampled

**Proportion of Animal Food Plants:**
- ☐ Low (5-25% cover)
- ☐ Medium (25-50% cover)
- ☒ High (>50% cover)

**Cover Distribution:**
- ☒ Continuous Cover
- ☐ Small Scattered Patches
- ☐ 1 or More Large Patches; Parts of Site Open
- ☐ Solitary, Scattered Stems

**Dead Woody Material:**
- ☐ Abrundant (>50 of wetland surface)
- ☐ Moderately Abrundant (25-50% of surface)
- ☒ Low Abrundance (0-25% of surface)

**Interspersion of Cover and Open Water:**
- ☐ 26-75% Scattered or Peripheral
- ☐ >75% Scattered or Peripheral
- ☒ <25% Scattered or Peripheral
- ☒ 100% Cover or Open Water

**Stream Sinuosity:**
- ☐ Highly Convoluted (index 1.50 or >)
- ☐ Moderately Convoluted (index 1.25-1.50)
- ☒ Straight/Slightly Irreg. (index) 1.10-1.25

**Presence of Islands:**
- ☐ Several to Many
- ☐ One or Few
- ☒ Absent

CRS-1 SLOPE 16 ac 68%
RIVERINE 7 ac 32%
*DEPRESSION 0.15 ac 21%
Total 23± ac
*WETLAND CLASS < 25% NOT EVALUATED SEPARATELY

## 2.9.1 Modification of Ground Water Discharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | |
| • Inlet/Outlet Class | • perennial inlet/no outlet | 0 | 0 | 0 | 0 |
| • Nested Piezometer Data | • recharge condition | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezo-metric Surface | • wetland substrate elevation above piezometric surface | 0 | 0 | 0 | 0 |
| Direct Indicators of Function | | | | | |
| • Presence of Springs and Seeps | • evidence of perennial seeps or springs | 18 | 15 | 15 | 18 |
| • Nested Piezometer Data | • discharge condition | 18 | 15 | 15 | 18 |
| • Relationship to Regional Peizometeric Surface | • wetland substrate elevation below piezometric surface | 18 | 15 | 15 | 18 |
| • Inlet/Outlet Class | • no inlet/perennial outlet | 18 | 15 | 15 | 18 |
| Primary Variables | | | | | |
| • Microrelief of Wetland Surface | • pronounced | 3 | 3 | 3 | 3 |
| | • well developed | 2 | 2 | 2 | 2 |
| | • poorly developed | 1 | 1 | 1 | 1 |
| | • absent | 0 | 0 | 0 | 0 |
| • Inlet/Outlet Class | • perennial inlet/perennial outlet | 3 | 3 | 0 | 3 |
| | • intermittent inlet/perennial outlet | 2 | 2 | 0 | 2 |
| | • all other classes | 0 | 0 | 0 | 0 |
| • pH | • alkaline | 3 | 3 | 3 | 3 |
| | • circumneutral | 2 | 2 | 2 | 2 |
| | • acid | 0 | 0 | 0 | 0 |
| | • no water present | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • high permeability stratified deposits | 3 | 3 | 3 | 3 |
| | • low permeability stratified deposits | 2 | 2 | 2 | 2 |
| | • glacial till | 1 | 1 | 1 | 1 |
| • Wetland Water Regime | • wet; permanently flooded, intermittently exposed, semipermanently flooded | 3 | 0 | 3 | 3 |
| | • drier; seasonally flooded, temporarily flooded, saturated | 1 | 0 | 1 | 1 |

(continued)

## 2.9.2 Modification of Ground Water Recharge (Continued)

| VARIABLES | CONDITIONS HGM TYPES: | | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|---|
| Direct Indicators of Function | | | | | | | |
| • Inlet/Outlet Class | • | perennial inlet/no outlet | 21 | | | | 21 |
| • Nested Piezometer Data | • | recharge condition | 21 | | | | 21 |
| • Relationship to Regional Peizometeric Surface | • | wetland substrate elevation below piezometric surface | 21 | | | | 21 |
| Primary Variables | | | | | | | |
| • Microrelief of Wetland Surface | • | Poorly Developed | 3 | 3 | 1 | 3 | 3 |
| | • | Absent | 3 | 3 | 1 | 3 | 3 |
| | • | Well Developed | 2 | 2 | 2 | 2 | 2 |
| | • | Pronounced | 1 | 1 | 3 | 1 | 1 |
| • Inlet/Outlet Class | • | Perennial Inlet/Intermittent Outlet | 3 | 0 | 0 | 0 | 3 |
| | • | All Other Classes | 0 | 0 | 0 | 0 | 0 |
| • pH | • | Acid | 3 | 3 | 3 | 3 | 3 |
| | • | Circumneutral | 2 | 2 | 2 | 2 | 2 |
| | • | Alkaline | 1 | 1 | 1 | 1 | 1 |
| | • | No water present | 0 | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • | Glacial Till | 3 | 1 | 1 | 1 | 3 |
| | • | Low Permeability Stratified Deposits | 2 | 2 | 2 | 2 | 2 |
| | • | High Permeability Stratified Deposits | 1 | 3 | 3 | 3 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • | High Fluctuation | 3 | 3 | 0 | 3 | 3 |
| | • | Low Fluctuation | 2 | 2 | 0 | 2 | 2 |
| | • | Never Inundated | 1 | 1 | 0 | 1 | 1 |
| • Wetland Water Regime | • | Drier: Seasonally Flooded, Temporarily Flooded, Saturated | 3 | 3 | 0 | 3 | 3 |
| | • | Wet: Permanently Flooded, Intermittently Exposed, Semipermanently Flooded | 1 | 1 | 0 | | 1 |
| | | | — | — | — | — | — |
| • Soil Type | • | Gravelly or Sandy Mineral Hydric | 3 | 3 | 0 | 3 | 3 |
| | • | Silty or Clayey Mineral Hydric | 2 | 2 | 0 | 2 | 2 |
| | • | Sapric Histosol | 1 | 1 | 0 | 1 | 1 |
| | • | Fibric or Hemic Histosol | 0 | 0 | 3 | 0 | 0 |
| | | Total Score: | | | | 13 | |
| | | Model Range: | 4-21 | 4-18 | 2-12 | 4-18 | 4-21 |
| | | Functional Capacity Index: | Total Score / 21 | / 18 | / 12 | 13 / 18 = 0.72 | / 21 |
| | | Index Range: | 0.19-1.0 | 0.22-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model should be applied to both year long and seasonal recharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a recharge mode for roughly half the year.

## 2.9.1 Modification of Ground Water Discharge (Continued)

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| • Soil Type | • histosol | 3 | 3 | 3 | 3 |
| | • mineral hydric soil | 1 | 1 | 1 | 1 |
| | | – | – | 9 | – |
| | Total Score: | | | | |
| | Model Range: | 3-18 | 2-15 | 3-15 | 3-18 |
| | Functional Capacity Index: | Total Score 18 | 15 =10 | 7=0.47 | 18 |
| | Index Range: | 0.19-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model can be applied to both year long and seasonal discharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a discharge mode for roughly half the year.

## 2.9.2 Modification of Ground Water Recharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | | |
| • Inlet/Outlet Class | • no inlet/perennial outlet; intermittent inlet/perennial outlet | 0 | | | | 0 |
| • Nested Piezometer Data | • discharge condition | 0 | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezometric Surface | • wetland substrate elevation above or at piezometric surface | 0 | 0 | 0 | 0 | 0 |
| • Presence of Seeps and Springs | • presence of seeps or springs | 0 | 0 | 0 | 0 | 0 |

(continued)

## 2.9.2 Modification of Ground Water Recharge (Continued)

| VARIABLES | CONDITIONS HGM TYPES: | | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|---|
| Direct Indicators of Function | | | | | | | |
| • Inlet/Outlet Class | • | perennial inlet/no outlet | 21 | | | | 21 |
| • Nested Piezometer Data | • | recharge condition | 21 | | | | 21 |
| • Relationship to Regional Peizometeric Surface | • | wetland substrate elevation below piezometric surface | 21 | | | | 21 |
| Primary Variables | | | | | | | |
| • Microrelief of Wetland Surface | • | Poorly Developed | 3 | 3 | 1 | 3 | 3 |
| | • | Absent | 3 | 3 | 1 | 3 | 3 |
| | • | Well Developed | 2 | 2 | 2 | 2 | 2 |
| | • | Pronounced | 1 | 1 | 3 | 1 | 1 |
| • Inlet/Outlet Class | • | Perennial Inlet/Intermittent Outlet | 3 | 0 | 0 | 0 | 3 |
| | • | All Other Classes | 0 | 0 | 0 | 0 | 0 |
| • pH | • | Acid | 3 | 3 | 3 | 3 | 3 |
| | • | Circumneutral | 2 | 2 | 2 | 2 | 2 |
| | • | Alkaline | 1 | 1 | 1 | 1 | 1 |
| | • | No water present | 0 | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • | Glacial Till | 3 | 1 | 1 | 1 | 3 |
| | • | Low Permeability Stratified Deposits | 2 | 2 | 2 | 2 | 2 |
| | • | High Permeability Stratified Deposits | 1 | 3 | 3 | 3 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • | High Fluctuation | 3 | 3 | 0 | 3 | 3 |
| | • | Low Fluctuation | 2 | 2 | 0 | 2 | 2 |
| | • | Never Inundated | 1 | 1 | 0 | 1 | 1 |
| • Wetland Water Regime | • | Drier: Seasonally Flooded, Temporarily Flooded, Saturated | 3 | 3 | 0 | 3 | 3 |
| | • | Wet: Permanently Flooded, Intermittently Exposed, Semipermanently Flooded | 1 | 1 | 0 | | 1 |
| | | | — | — | — | — | — |
| • Soil Type | • | Gravelly or Sandy Mineral Hydric | 3 | 3 | 0 | 3 | 3 |
| | • | Silty or Clayey Mineral Hydric | 2 | 2 | 0 | 2 | 2 |
| | • | Sapric Histosol | 1 | 1 | 0 | 1 | 1 |
| | • | Fibric or Hemic Histosol | 0 | 0 | 3 | 0 | 0 |
| | | Total Score: | | | | 13 | |
| | | Model Range: | 4-21 | 4-18 | 2-12 | 4-18 | 4-21 |
| | | Functional Capacity Index: | Total Score / 21 | / 18 | / 12 | 13 / 18 = 0.72 | / 21 |
| | | Index Range: | 0.19-1.0 | 0.22-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model should be applied to both year long and seasonal recharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a recharge mode for roughly half the year.

## 2.9.3 Storm and Flood-Water Storage

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | no outlet | | 27 | 21 | | | | 30 |
| Primary Variables | | | | | | | | |
| • Inlet/Outlet Class | • perennial inlet/intermittent outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent inlet/intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • no inlet/intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • non inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • intermittent inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • perennial inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Degree of Outlet Restriction | • restricted | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • unrestricted | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Basin Topographic Gradient | • low gradient | | 3 | 3 | 0 | 3 | 3 | 3 |
| | • high gradient | | 1 | 1 | 0 | 0 | 1 | 1 |
| • Wetland Water Regime | • Drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • Wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • high fluctuation | | 3 | 0 | 3 | 0 | 3 | 3 |
| | • low fluctuation | | 2 | 0 | 2 | 0 | 2 | 2 |
| | • never inundated | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Ratio of Wetland Area to Watershed Area | • large | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • small | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Microrelief of Wetland Surface | • pronounced | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • well developed | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • poorly developed | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Frequency of Overbank Flooding | • overbank flooding absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | • return interval of >5 yrs | | 0 | 0 | 1 | 0 | 1 | 1 |
| | • return interval of 2-5 yrs | | 0 | 0 | 2 | 0 | 2 | 2 |
| | • return interval of 1-2 yrs | | 0 | 0 | 3 | 0 | 3 | 3 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |

(continued)

### 2.9.3 Storm and Flood-Water Storage (Continued)

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| • Dead Woody Material | • abundant | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderately abundant | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | — | — | — | — | — | — |
| | | Total Score: | | 10 | | | 16 | |
| | | Model Range: | 4-27 | 4-21 | 2-21 | 0-12 | 3-24 | 4-30 |
| | | Functional Capacity Index: | Total Score | 10 = 0.48 | | | 16 = 0.67 | |
| | | | 27 | 21 | 21 | 12 | 24 | 30 |
| | | Index Range: | 0.15-1.0 | 0.19-1.0 | 0.09-1.0 | 0-1.0 | 0.12-1.0 | 0.13-1.0 |

### 2.9.4 Modification of Stream Flow

(This model is identical for all HGM types)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Indicators of Disfunction | no outlet | 0 |
| Direct Indicators of Function | none | |

Primary Variables

| Storm and Flood Water Storage Function Model Score | | | Modification of Groundwater Discharge Function Model Score | | | |
|---|---|---|---|---|---|---|
| High* | 3 | x | High | 3 | = | 9 |
| Mod | 2 | x | High | 3 | = | 6 |
| Low | 1 | x | High | 3 | = | 3 |
| High | 3 | x | Mod | 2 | = | 6 |
| Mod | 2 | x | Mod | 2 | = | 4 |
| Low | 1 | x | Mod | 2 | = | 2 |
| High | 3 | x | Low | 1 | = | 3 |
| Mod | 2 | x | Low | 1 | = | 2 |
| Low | 1 | x | Low | 1 | = | 1 |

Total Score:

Model Range: 1-9

Functional Capacity Index: Total Score 9 (6/9 = 0.67; 6/9 = 0.67)

Index Range: 0.11-1.0

*High = FCI of 0.67-1.0, Mod = FCI of 0.34-0.66, Low = FCI of 0-0.33 for the Storm and Flood Water Storage and Modification of Ground Water Discharge Function Model Scores.

## 2.9.5 Modification of Water Quality

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | evidence of sedimentation | | 18 | 15 | 12 | 12 | 12 | 18 |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • low intensity | | 3 | (3) | 3 | 3 | (3) | 3 |
| | • moderate intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • restricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • no outlet | | 2 | 0 | 0 | 0 | 0 | 2 |
| | • unrestricted outflow | | 1 | (0) | 0 | 0 | (0) | 1 |
| • Inlet/Outlet Type | • no outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 2 | (2) | 0 | 0 | 0 | 2 |
| | • perennial outlet | | 1 | 1 | 0 | 0 | (0) | 1 |
| • Dominant Wetland Type | • forested wetland | | 3 | (3) | 3 | 3 | (3) | 3 |
| | • scrub-shrub | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • emergent wetland | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • aquatic bed | | 1 | 0 | 0 | 0 | 0 | 0 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Cover Distribution | • forming a continuous cover | | 3 | (3) | 3 | 3 | (3) | 3 |
| | • growing in small scattered patches | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • one or more large patches | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • solitary scattered stems | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • histosol or clayey soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • silty soil | | 2 | 2 | 2 | 0 | 2 | 2 |
| | • sandy or gravelly soil | | 1 | (1) | 1 | 0 | (1) | 1 |
| | | | — | — | — | — | — | — |
| | Total Score: | | | 12 | | | 10 | |
| | Model Range: | | 4-18 | 3-15 | 2-12 | 1-12 | 2-12 | 4-18 |
| | Functional Capacity Index: | | Total Score / 18 | 12 / 15 = 0,80 | — / 12 | — / 12 | 10 / 12 = 0,83 | — / 18 |
| | Index Range: | | 0.22-1.0 | 0.20-1.0 | 0.16-1.0 | 0.8-1.0 | 0.16-1.0 | 0.22-1.0 |

## 2.9.6 Export of Detritus

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | no outlet | | 0 | 0 | | 0 | | 0 |
| Direct Indicators of Function | none | | | | | | | |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • moderate intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • low intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • unrestricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • restricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Class | • perennial outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Wetland Water Regime | • drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • medium | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • mineral hydric soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • histosol | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Total Score: | — | 12 | — | — | 11 | — |
| | | Model Range: | 5-18 | 4-15 | 3-12 | 2-10 | 3-12 | 5-18 |
| | | Functional Capacity Index: | Total Score / 18 | 12 / 15 = 0.80 | — / 12 | — / 10 | 11 / 12 = 0.92 | — / 18 |
| | | Index Range: | 0.27-1.0 | 0.26-1.0 | 0.25-1.0 | 0.20-1.0 | 0.25-1.0 | 0.27-1.0 |

## 2.9.6 Export of Detritus

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | no outlet | | 0 | 0 | | 0 | | 0 |
| Direct Indicators of Function | none | | | | | | | |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • moderate intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • low intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • unrestricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • restricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Class | • perennial outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Wetland Water Regime | • drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • medium | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • mineral hydric soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • histosol | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Total Score: | — | 12 | — | — | 11 | — |
| | | Model Range: | 5-18 | 4-15 | 3-12 | 2-10 | 3-12 | 5-18 |
| | | Functional Capacity Index: | Total Score / 18 | 12 / 15 = 0.80 | — / 12 | — / 10 | 11 / 12 = 0.92 | — / 18 |
| | | Index Range: | 0.27-1.0 | 0.26-1.0 | 0.25-1.0 | 0.20-1.0 | 0.25-1.0 | 0.27-1.0 |

## 2.9.7 Contribution to Abundance and Diversity of Wetland Vegetation

(This model is identical for all HGM types)

| VARIABLES | | CONDITIONS | WEIGHTS |
|---|---|---|---|
| Indicators of Disfunction | | no vegetation | 0 |
| Direct Indicators of Function | | none | |
| Primary Variables | | | |
| • | Plant Species Diversity | • high diversity<br>• medium diversity<br>• low diversity | 5<br>3<br>1 |
| • | Vegetation Density/Dominance | • high/very high<br>• medium<br>• sparse/low | 5<br>3<br>1 |
| • | Wetland Juxtaposition | • connected upstream and downstream<br>• connected above or below<br>• other wetlands nearby but not connected (400 m or closer)<br>• isolated | 5<br>3<br>1<br>0 |
| | | Total Score: | |
| | | Model Range: | 2-15 |
| | | Functional Capacity Index: | = Total Score / 15 |
| | | Index Range: | 0.13-1.0 |

11/15 = 0,73

9/15 = 0,60

### 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna

(This model is identical for all HGM types except Slope Wetlands for which "Interspersion of Vegetation Cover and Open Water" does not apply))

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Direct Indicators of Disfunction | none | |
| Direct Indicators of Function | none | |
| Primary Variables | | |
| • Watershed Land Use | • low intensity (0-25% urbanized) | 3 |
| | • moderate intensity (25-50% urbanized) | 2 |
| | • high intensity (>50% urbanized) | 1 |
| • Wetland Land Use | • low intensity | 3 |
| | • moderate intensity | 2 |
| | • high intensity | 1 |
| • Wetland Water Regime | • wet: permanently flooded, intermittently exposed, semipermanently flooded | 3 |
| | • drier: seasonally flooded, temporarily flooded, saturated | 1 |
| • Microrelief of Wetland Surface | • pronounced | 3 |
| | • well developed | 2 |
| | • poorly developed | 1 |
| | • absent | 0 |
| • Number of Wetland types and Relative Proportions | • 5 or more types | 3 |
| | • 3-4 types | 2 |
| | • 1-2 types | 1 |
| | • no vegetation | 0 |
| | • even distribution | 3 |
| | • moderately even distribution | 2 |
| | • highly uneven distribution | 1 |
| | • no vegetation | 0 |
| • Vegetation Interspersion | • high interspersion | 3 |
| | • moderate interspersion | 2 |
| | • low interspersion | 1 |
| | • no vegetation | 0 |
| • Number of Layers and Percent Cover | • 5 or more layers | 3 |
| | • 3-4 layers | 2 |
| | • 1-2 layers | 1 |
| | • no vegetation | 0 |
| | • layers well developed (>50% cover) | 3 |
| | • layers with moderate cover (26-50% cover) | 2 |
| | • layers poorly distinguishable (<25% cover) | 1 |
| | • no vegetation | 0 |

(continued)

## 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna (Continued)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| • Interspersion of Vegetation Cover and Open Water | • 26-75% scattered or peripheral | 3 |
| | • >75% scattered or peripheral | 2 |
| | • <25% scattered or peripheral | 1 |
| | • 100% cover or open water | 1 |
| | • no vegetation | 0 |
| • Size | • large (>100 acres) | 3 |
| | • medium (10-100 acres) | 2 |
| | • small (<10 acres) | 1 |
| • Wetland Juxtaposition | • other wetlands within 400 m and connected above or below | 3 |
| | • other wetlands within 400 m but not connected | 1 |
| | • wetland isolated | 0 |

Slope Wetlands:

Model Range: 4-33

Functional Capacity Index = $\frac{\text{Total Score}}{33}$

Index Range: 0.12-1.0

All Other HGM Types:

Total Score: 28 28

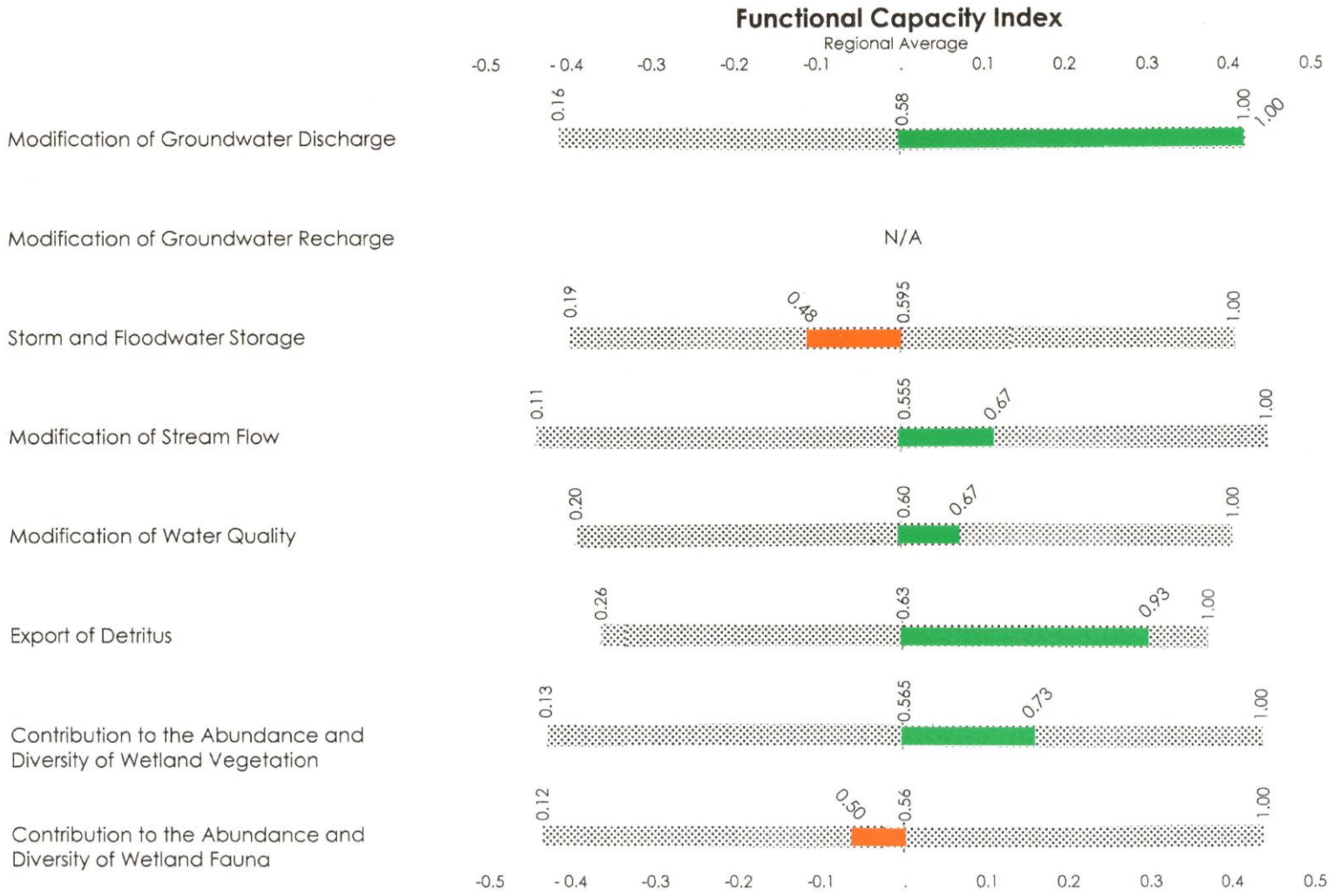
Model Range: 4-36

Functional Capacity Index = $\frac{\text{Total Score}}{36}$ $\frac{28}{36} = 0.78$ $\frac{28}{36} = 0.78$

Index Range 0.11-1.0

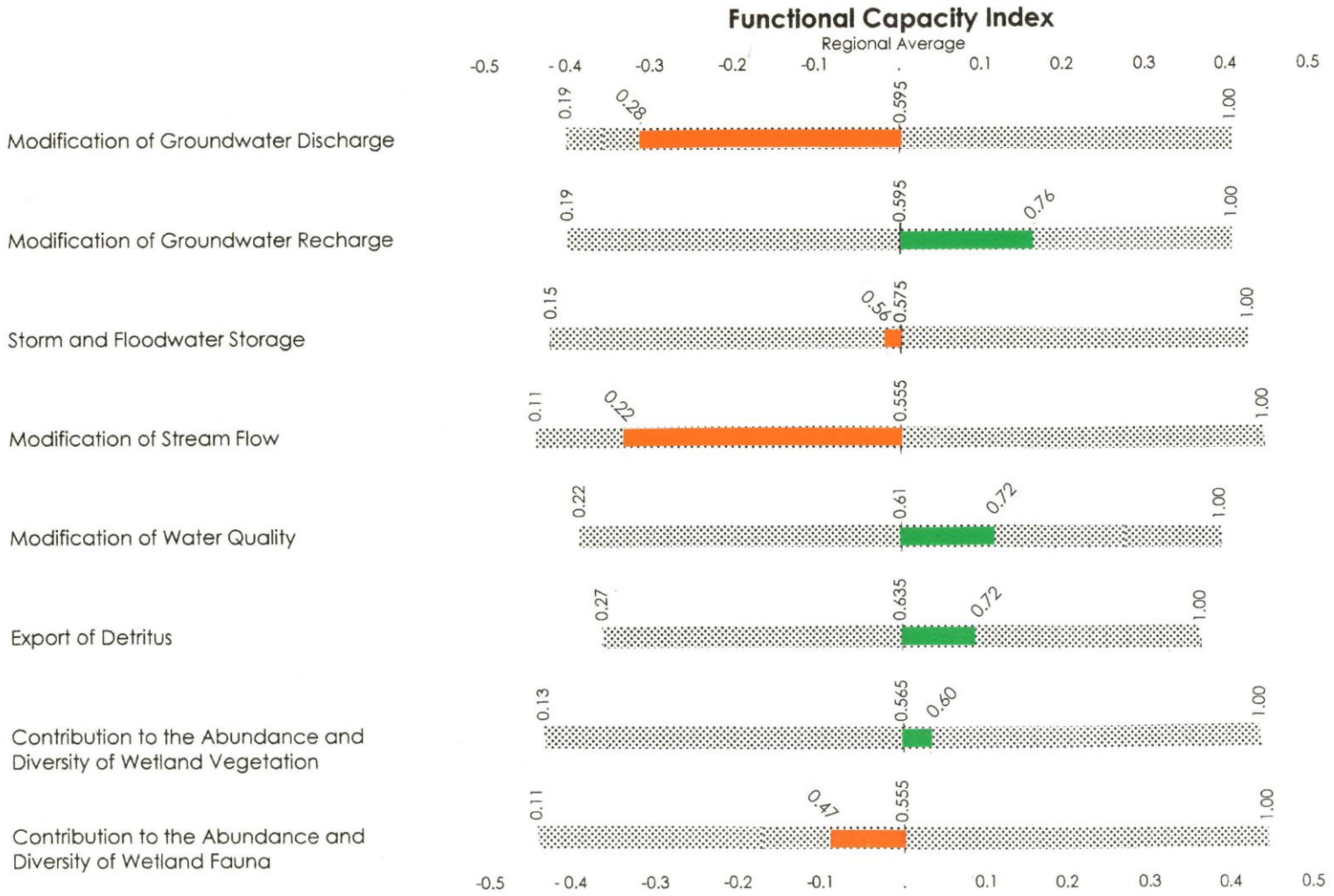
**Croton Reservoir South** **Sloping Wetland** **Study Area: CRS-2**

0.27 ac. - 74% of total 0.36 ac. wetlands



**Croton Reservoir South** **Depression Wetland** **Study Area: CRS-2**

0.09 ac. - 26% of total 0.36 ac. wetlands



# WETLAND INVENTORY DATA

SLOPE 0.27 ac
DEPRESSION 0.09 ac
Total 0.36 ac

Project Number: YORKTOWN Date:

Wetland Number: CRS-2 SLOPE/DEPRESSION

Aerial Photo Numbers:

USGS Quadrangle: OSSINING

Field Investigators: BD.

## PART 1 - CHARACTERIZATION of WETLAND

### SURFACE WATER FLOW VECTORS

| Condition | Percent/Acreage | |
|---|---|---|
|  | 26% | Depressional |
|  | 74% | Slope |
| | | Flat |
|  | | Extensive Peatland |
|  | | Lacustrine Fringe |
|  | | Riverine |

### VEGETATION TYPES

| Type | Percent/Acreage |
|---|---|
| Forested Wetland | |
| Evergreen | |
| Needle-leaved | |
| Deciduous | |
| Broad-leaved | |
| Needle-leaved | |
| Scrub Shrub | |
| Evergreen | |
| Broad-leaved | |
| Needle-leaved | |
| Deciduous | |
| Broad-leaved | |
| Needle-leaved | |
| Emergent Wetland | |
| Persistent | 100% |
| Non-persistent | |
| Aquatic Bed | |
| Total | 100% |

### SOIL TYPES

Histosol
- Fibric ☐
- Hemic ☐
- Sapric ☐

Mineral Hydric Soil
- Gravelly ☐
- Sandy ■
- Silty ☐
- Clayey ☐

### GEOLOGY

Surficial: TILL

Bedrock:

Comments: MAN-MADE AREA OF EXCAVATION IN UPLAND SOIL — POSSIBLY INTERCEPTING WATER TABLE & IS UNDRAINED DEPRESSION

### PLANT SPECIES

| | OW | FW | F | FU | OU | DOM | COM | OCC | C | S | TS | LS | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SKUNK CABBAGE | | | | | | | ■ | | | | | | ■ |
| HIGHBUSH BLUEBERRY | | | | | | | | ■ | | | | ■ | |
| SWEET BIRCH | | | | | | | | ■ | ■ | | | | |
| BLACK CHERRY | | | | | | | | ■ | ■ | | | | |
| BUSH | | | | | | | ■ | | | | | | ■ |
| CINNAMON FERN | | | | | | ■ | | | | | | | ■ |
| MISC FERNS | | | | | | | ■ | | | | | | ■ |
| GRASSES & SEDGES | | | | | | ■ | | | | | | | ■ |

| | | | |
|---|---|---|---|
| OW | Obligate Wetland | COM | Common |
| FW | Facultative Wetland | OCC | Occasional |
| F | Facultative | C | Canopy |
| FU | Facultative Upland | S | Sapling |
| OU | Obligate Upland | TS | Tall Shrub |
| DOM | Dominant | LS | Low Shrub |
| | | H | Herb |

### PRE-EMPTIVE STATUS

- ____ Public ownership
- ____ Wildlife management area
- ____ Fisheries management area
- ____ Designated State or Federal protected wetland
- ____ Documented habitat for state or federal listed species
- ____ Regionally scarce wetland category
- ____ Historic/archaeologic area

# WETLAND INVENTORY DATA (continued)

## PART 2 - CHARACTERIZATION of MODEL VARIABLES

### LANDSCAPE VARIABLES

**Size:**
- [ ] Small (<10 acres)
- [ ] Medium (10-100 acres)
- [ ] Large (>100 acres)

**Wetland Juxtaposition:**
- [ ] Connected Upstream and Downstream
- [ ] Only Connected Above
- [ ] Only Connected Below
- [ ] Other Wetlands Nearby but not Connected
- [ ] Wetland Isolated

**Fire Occurence and Frequency:**
- [ ] Natural; Predictable Frequency
- [ ] Natural; Sporadic Frequency
- [ ] Human-caused; Predictable
- [ ] Human-caused; Sporadic
- [ ] Rare Event
- [ ] No Evidence

**Regional Scarcity:**
- [ ] Not Scarce (>5% of total wetland area of region)
- [ ] Scarce (<5% of total wetland area of region)

**Watershed Land Use:**
- [ ] > 50% urbanized
- [ ] 25-50% urbanized
- [ ] 0-25% urbanized

### HYDROLOGIC VARIABLES

**Surface Water Level Fluctuation of Wetland:**
- [ ] High Fluctuation
- [ ] Low Fluctuation
- [ ] Never Inundated

**Frequency of Overbank Flooding:**
- [ ] Return Interval > 5 yrs.
- [ ] Return Interval 2-5 yrs.
- [ ] Return Interval 1-2 yrs.
- [ ] No Overbank Flooding

**pH:**
- [ ] Acid <5.5
- [ ] Circumneutral 5.5-7.4
- [ ] Alkaline >7.4
- [ ] No Water

**Surficial Geologic Deposit Under Wetland**
- [ ] Low Permeability Stratified Deposits
- [ ] High Permeability Stratified Deposits
- [ ] Glacial Till

**Wetland Land Use:**
- [ ] High Intensity (ie. agriculture)
- [ ] Moderate Intensity (ie. forestry)
- [ ] Low Intensity (ie. open space)

**Wetland Water Regime:**
- [ ] Wet: Perm Flooded, Intermittently Exposed, Semiperm. Flooded
- [ ] Drier: Seasonally Flooded, Temporarily Flooded, Saturated

**Basin Topographic Gradient:**
- [ ] High Gradient >2%
- [ ] Low Gradient <2%

**Degree of Outlet Restriction:**
- [ ] Restricted Outflow
- [ ] Unrestricted Outflow
- [ ] No Outflow

**Ratio of Wetland Area to Watershed Area:**
- [ ] High >10%
- [ ] Low <10%

**Microrelief of Wetland Surface:**
- [ ] Pronounced >45 cm
- [ ] Well Developed 15-45 cm
- [ ] Poorly Developed <15 cm
- [ ] Absent

**Inlet/Outlet Class:**
- [ ] No Inlet/No Outlet
- [ ] No Inlet/Intermittent Outlet
- [ ] No Inlet/Perennial Outlet
- [ ] Intermittent Inlet/No Outlet
- [ ] Intermittent Inlet/Intermittent Outlet
- [ ] Intermittent Outlet/Perennial Outlet
- [ ] Perennial Inlet/No Outlet
- [ ] Perennial Inlet/ Intermittent Outlet
- [ ] Perennial Inlet/Perennial Outlet

**Nested Piezometer Data:**
- [ ] Recharge
- [ ] Discharge
- [ ] Horizontal Flow
- [ ] Not Available

**Relationship of Wetlands' Substrate Elevation to Regional Piezometric Surface:**
- [ ] Piez. Surface Above or at Substrate elev.
- [ ] Piez. Surface below Substrate elev.
- [ ] Not Available

**Evidence of Sedimentation:**
- [ ] No Evidence Observed
- [ ] Sediment Observed on Wetland Substrate
- [ ] Fluvaquent Soils

**Evidence of Seeps and Springs:**
- [ ] No Seeps or Springs
- [ ] Seeps Observed
- [ ] Perennial Spring
- [ ] Intermittent Spring

### SOIL VARIABLES

**Soil Lacking:**
- [ ]

**Histosol:**
- [ ] Fibric
- [ ] Hemic
- [ ] Sapric

**Mineral Hydric Soil:**
- [ ] Gravelly
- [ ] Sandy
- [ ] Silty
- [ ] Clayey

### VEGETATION VARIABLES

**Vegetation Lacking:**
- [ ]

**Dominant Wetland Type:**
- [ ] Forested - Evergreen - Needle-leaved
- [ ] Forested - Deciduous - Broad-leaved
- [ ] Forested - Deciduous - Needle-leaved
- [ ] Scrub Shrub - Evergreen - Broad-leaved
- [ ] Scrub Shrub - Evergreen - Needle-leaved
- [ ] Scrub Shrub - Deciduous - Broad-leaved
- [ ] Scrub Shrub - Deciduous - Needle-leaved
- [ ] Emergent - Persistent
- [ ] Emergent - Non-persistent
- [ ] Aquatic Bed

**Number of Types & Relative Proportions:**

| Number of Types | Evenness of Distribution |
|---|---|
| [ ] Actual # | [ ] Even Distribution |
| [ ] 5 | [ ] Moderately Even Distribution |
| [ ] 4 | [ ] Highly Uneven Distribution |
| [ ] 3 | |
| [ ] 2 | |
| [ ] 1 | |

**Vegetation Density/Dominance:**
- [ ] Sparse (0-20%)
- [ ] Low Density (20-40%)
- [ ] Medium Density (40-60%)
- [ ] High Density (60-80%)
- [ ] Very High Density (80-100%)

**Vegetative Interspersion:**
- [ ] High (small groupings, diverse and interspersed)
- [ ] Moderate (broken irregular rings)
- [ ] Low (large patches, concentric rings)

**Number of Layers and Percent Cover:**

| Number of Layers | % Cover |
|---|---|
| [ ] 6 or > (actual #) | 1. submergents: |
| [ ] 5 | 2. floating: |
| [ ] 4 | 3. moss-lichen: |
| [ ] 3 | 4. short herb: |
| [ ] 2 | 5. tall herb: |
| [ ] 1 | 6. dwarf shrub: |
| | 7. short shrub: |
| | 8. tall shrub: |
| | 9. sapling: |
| | 10. tree: |

**Plant Species Diversity:**
- [ ] Low 1-2 plots sampled
- [ ] Medium 3-4 plots sampled
- [ ] High 5 or more plots sampled

**Proportion of Animal Food Plants:**
- [ ] Low (5-25% cover)
- [ ] Medium (25-50% cover)
- [ ] High (>50% cover)

**Cover Distribution:**
- [ ] Continuous Cover
- [ ] Small Scattered Patches
- [ ] 1 or More Large Patches; Parts of Site Open
- [ ] Solitary, Scattered Stems

**Dead Woody Material:**
- [ ] Abundant (>50 of wetland surface)
- [ ] Moderately Abundant (25-50% of surface)
- [ ] Low Abundance (0-25% of surface)

**Interspersion of Cover and Open Water:**
- [ ] 26-75% Scattered or Peripheral
- [ ] >75% Scattered or Peripheral
- [ ] <25% Scattered or Peripheral
- [ ] 100% Cover or Open Water

**Stream Sinuosity:**
- [ ] Highly Convoluted (index 1.50 or >)
- [ ] Moderately Convoluted (index 1.25-1.50)
- [ ] Straight/Slightly Irreg. (index) 1.10-1.25

**Presence of Islands:**
- [ ] Several to Many
- [ ] One or Few
- [ ] Absent

CRS-2 SLOPE (0.27 ac) / DEPRESSION (0.09 ac) (0.36 ac)

## 2.9.1 Modification of Ground Water Discharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | |
| • Inlet/Outlet Class | • perennial inlet/no outlet | 0 | 0 | 0 | 0 |
| • Nested Piezometer Data | • recharge condition | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezo-metric Surface | • wetland substrate elevation above piezometric surface | 0 | 0 | 0 | 0 |
| Direct Indicators of Function | | | | | |
| • Presence of Springs and Seeps | • evidence of perennial seeps or springs | 18 | 15 | 15 | 18 |
| • Nested Piezometer Data | • discharge condition | 18 | 15 | 15 | 18 |
| • Relationship to Regional Peizometeric Surface | • wetland substrate elevation below piezometric surface | 18 | 15 | 15 | 18 |
| • Inlet/Outlet Class | • no inlet/perennial outlet | 18 | 15 | 15 | 18 |
| Primary Variables | | | | | |
| • Microrelief of Wetland Surface | • pronounced | 3 | 3 | 3 | 3 |
| | • well developed | 2 | 2 | 2 | 2 |
| | • poorly developed | 1 | 1 | 1 | 1 |
| | • absent | 0 | 0 | 0 | 0 |
| • Inlet/Outlet Class | • perennial inlet/perennial outlet | 3 | 3 | 0 | 3 |
| | • intermittent inlet/perennial outlet | 2 | 2 | 0 | 2 |
| | • all other classes | 0 | 0 | 0 | 0 |
| • pH | • alkaline | 3 | 3 | 3 | 3 |
| | • circumneutral | 2 | 2 | 2 | 2 |
| | • acid | 0 | 0 | 0 | 0 |
| | • no water present | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • high permeability stratified deposits | 3 | 3 | 3 | 3 |
| | • low permeability stratified deposits | 2 | 2 | 2 | 2 |
| | • glacial till | 1 | 1 | 1 | 1 |
| • Wetland Water Regime | • wet; permanently flooded, inter-mittently exposed, semipermanently flooded | 3 | 0 | 3 | 3 |
| | • drier; seasonally flooded, tempo-rarily flooded, saturated | 1 | 0 | 1 | 1 |

(continued)

2.9.1 **Modification of Ground Water Discharge (Continued)**

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| • Soil Type | • histosol | 3 | 3 | 3 | 3 |
| | • mineral hydric soil | 1 | 1 | 1 | 1 |
| | | 5 | 4 | – | – |
| | Total Score: | | | | |
| | Model Range: | 3-18 | 2-15 | 3-15 | 3-18 |
| | Functional Capacity Index: | Total Score 5 = 0.28 | 4 = 0.27 | — | — |
| | | 18 | 15 | 15 | 18 |
| | Index Range: | 0.19-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model can be applied to both year long and seasonal discharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a discharge mode for roughly half the year.

2.9.2 **Modification of Ground Water Recharge**

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | | |
| • Inlet/Outlet Class | • no inlet/perennial outlet; intermittent inlet/perennial outlet | 0 | | | | 0 |
| • Nested Piezometer Data | • discharge condition | 0 | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezometric Surface | • wetland substrate elevation above or at piezometric surface | 0 | 0 | 0 | 0 | 0 |
| • Presence of Seeps and Springs | • presence of seeps or springs | 0 | 0 | 0 | 0 | 0 |

(continued)

## 2.9.2 Modification of Ground Water Recharge (Continued)

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|---|
| Direct Indicators of Function | | | | | | | |
| • Inlet/Outlet Class | • | perennial inlet/no outlet | 21 | | | | 21 |
| • Nested Piezometer Data | • | recharge condition | 21 | | | | 21 |
| • Relationship to Regional Peizometeric Surface | • | wetland substrate elevation below piezometric surface | 21 | | | | 21 |
| Primary Variables | | | | | | | |
| • Microrelief of Wetland Surface | • | Poorly Developed | 3 | 3 | 1 | 3 | 3 |
| | • | Absent | 3 | 3 | 1 | 3 | 3 |
| | • | Well Developed | 2 | 2 | 2 | 2 | 2 |
| | • | Pronounced | 1 | 1 | 3 | 1 | 1 |
| • Inlet/Outlet Class | • | Perennial Inlet/Intermittent Outlet | 3 | 0 | 0 | 0 | 3 |
| | • | All Other Classes | 0 | 0 | 0 | 0 | 0 |
| • pH | • | Acid | 3 | 3 | 3 | 3 | 3 |
| | • | Circumneutral | 2 | 2 | 2 | 2 | 2 |
| | • | Alkaline | 1 | 1 | 1 | 1 | 1 |
| | • | No water present | 0 | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • | Glacial Till | 3 | 1 | 1 | 1 | 3 |
| | • | Low Permeability Stratified Deposits | 2 | 2 | 2 | 2 | 2 |
| | • | High Permeability Stratified Deposits | 1 | 3 | 3 | 3 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • | High Fluctuation | 3 | 3 | 0 | 3 | 3 |
| | • | Low Fluctuation | 2 | 2 | 0 | 2 | 2 |
| | • | Never Inundated | 1 | 1 | 0 | 1 | 1 |
| • Wetland Water Regime | • | Drier: Seasonally Flooded, Temporarily Flooded, Saturated | 3 | 3 | 0 | 3 | 3 |
| | • | Wet: Permanently Flooded, Intermittently Exposed, Semipermanently Flooded | 1 | 1 | 0 | 1 | 1 |
| | | | — | — | — | — | — |
| • Soil Type | • | Gravelly or Sandy Mineral Hydric | 3 | 3 | 0 | 3 | 3 |
| | • | Silty or Clayey Mineral Hydric | 2 | 2 | 0 | 2 | 2 |
| | • | Sapric Histosol | 1 | 1 | 0 | 1 | 1 |
| | • | Fibric or Hemic Histosol | 0 | 0 | 3 | 0 | 0 |
| | | Total Score: | 16 | | | | |
| | | Model Range: | 4-21 | 4-18 | 2-12 | 4-18 | 4-21 |
| | | Functional Capacity Index: | Total Score / 21 | / 18 | / 12 | / 18 | / 21 |
| | | | 16 = 0.76 | | | | |
| | | Index Range: | 0.19-1.0 | 0.22-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model should be applied to both year long and seasonal recharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a recharge mode for roughly half the year.

## 2.9.3 Storm and Flood-Water Storage

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | no outlet | | 27 | 21 | | | | 30 |
| Primary Variables | | | | | | | | |
| • Inlet/Outlet Class | • perennial inlet/intermittent outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent inlet/intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • no inlet/intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • non inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • intermittent inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • perennial inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Degree of Outlet Restriction | • restricted | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • unrestricted | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Basin Topographic Gradient | • low gradient | | 3 | 3 | 0 | 3 | 3 | 3 |
| | • high gradient | | 1 | 1 | 0 | 0 | 1 | 1 |
| • Wetland Water Regime | • Drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • Wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • high fluctuation | | 3 | 0 | 3 | 0 | 3 | 3 |
| | • low fluctuation | | 2 | 0 | 2 | 0 | 2 | 2 |
| | • never inundated | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Ratio of Wetland Area to Watershed Area | • large | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • small | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Microrelief of Wetland Surface | • pronounced | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • well developed | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • poorly developed | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Frequency of Overbank Flooding | • overbank flooding absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | • return interval of >5 yrs | | 0 | 0 | 1 | 0 | 1 | 1 |
| | • return interval of 2-5 yrs | | 0 | 0 | 2 | 0 | 2 | 2 |
| | • return interval of 1-2 yrs | | 0 | 0 | 3 | 0 | 3 | 3 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |

(continued)

### 2.9.3 Storm and Flood-Water Storage (Continued)

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| • Dead Woody Material | • abundant | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderately abundant | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Total Score: | 15 | 9 | — | — | — | — |
| | | Model Range: | 4-27 | 4-21 | 2-21 | 0-12 | 3-24 | 4-30 |
| | | Functional Capacity Index: | Total Score | 15 = 0,56 / 9 = 0,43 | | | | |
| | | | 27 | 21 | 21 | 12 | 24 | 30 |
| | | Index Range: | 0.15-1.0 | 0.19-1.0 | 0.09-1.0 | 0-1.0 | 0.12-1.0 | 0.13-1.0 |

### 2.9.4 Modification of Stream Flow

(This model is identical for all HGM types)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Indicators of Disfunction | no outlet | 0 |
| Direct Indicators of Function | none | |

Primary Variables

| Storm and Flood Water Storage Function Model Score | | | Modification of Groundwater Discharge Function Model Score | | | |
|---|---|---|---|---|---|---|
| High* | 3 | x | High | 3 | = | 9 |
| Mod | 2 | x | High | 3 | = | 6 |
| Low | 1 | x | High | 3 | = | 3 |
| High | 3 | x | Mod | 2 | = | 6 |
| Mod | 2 | x | Mod | 2 | = | 4 |
| Low | 1 | x | Mod | 2 | = | 2 |
| High | 3 | x | Low | 1 | = | 3 |
| Mod | 2 | x | Low | 1 | = | 2 |
| Low | 1 | x | Low | 1 | = | 1 |

Total Score:

Model Range: 1-9 (2/9 = 0,22)

Functional Capacity Index: Total Score 9 (2/9 = 0,22)

Index Range: 0.11-1.0

*High = FCI of 0.67-1.0, Mod = FCI of 0.34-0.66, Low = FCI of 0-0.33 for the Storm and Flood Water Storage and Modification of Ground Water Discharge Function Model Scores.

## 2.9.5 Modification of Water Quality

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | evidence of sedimentation | | 18 | 15 | 12 | 12 | 12 | 18 |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • low intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • restricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • no outlet | | 2 | 0 | 0 | 0 | 0 | 2 |
| | • unrestricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Type | • no outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Dominant Wetland Type | • forested wetland | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • scrub-shrub | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • emergent wetland | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • aquatic bed | | 1 | 0 | 0 | 0 | 0 | 0 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Cover Distribution | • forming a continuous cover | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • growing in small scattered patches | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • one or more large patches | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • solitary scattered stems | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • histosol or clayey soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • silty soil | | 2 | 2 | 2 | 0 | 2 | 2 |
| | • sandy or gravelly soil | | 1 | 1 | 1 | 0 | 1 | 1 |
| | | | — | — | — | — | — | — |
| | | Total Score: | | 13 11 | | | | |
| | | Model Range: | 4-18 | 3-15 | 2-12 | 1-12 | 2-12 | 4-18 |
| | | Functional Capacity Index: | Total Score | 13 = 0.72 11 = 0.73 | | | | |
| | | | 18 | 15 | 12 | 12 | 12 | 18 |
| | | Index Range: | 0.22-1.0 | 0.20-1.0 | 0.16-1.0 | 0.8-1.0 | 0.16-1.0 | 0.22-1.0 |

## 2.9.6 Export of Detritus

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | no outlet | | 0 | 0 | | 0 | | 0 |
| Direct Indicators of Function | none | | | | | | | |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • moderate intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • low intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • unrestricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • restricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Class | • perennial outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Wetland Water Regime | • drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • medium | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • mineral hydric soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • histosol | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Total Score: | 13 | 12 | — | — | — | — |
| | | Model Range: | 5-18 | 4-15 | 3-12 | 2-10 | 3-12 | 5-18 |
| | | Functional Capacity Index: Total Score | 13 = 0.72<br>12 = 0.80 | | | | | |
| | | | 18 | 15 | 12 | 10 | 12 | 18 |
| | | Index Range: | 0.27-1.0 | 0.26-1.0 | 0.25-1.0 | 0.20-1.0 | 0.25-1.0 | 0.27-1.0 |

## 2.9.7 Contribution to Abundance and Diversity of Wetland Vegetation

(This model is identical for all HGM types)

| VARIABLES | | CONDITIONS | WEIGHTS |
|---|---|---|---|
| Indicators of Disfunction | | no vegetation | 0 |
| Direct Indicators of Function | | none | |
| Primary Variables | | | |
| • | Plant Species Diversity | • high diversity<br>• medium diversity<br>• low diversity | 5<br>3<br>(1) |
| • | Vegetation Density/Dominance | • high/very high<br>• medium<br>• sparse/low | (5)<br>3<br>1 |
| • | Wetland Juxtaposition | • connected upstream and downstream<br>• connected above or below<br>• other wetlands nearby but not connected (400 m or closer)<br>• isolated | 5<br>(3)<br>1<br>0 |
| | | Total Score: | 9 |
| | | Model Range: | 2-15 |
| | | Functional Capacity Index: | = Total Score / 15 → 9 = 0.60 |
| | | Index Range: | 0.13-1.0 |

### 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna

(This model is identical for all HGM types except Slope Wetlands for which "Interspersion of Vegetation Cover and Open Water" does not apply))

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Direct Indicators of Disfunction | none | |
| Direct Indicators of Function | none | |
| Primary Variables | | |
| • Watershed Land Use | • low intensity (0-25% urbanized) | 3 |
| | • moderate intensity (25-50% urbanized) | 2 |
| | • high intensity (>50% urbanized) | 1 |
| • Wetland Land Use | • low intensity | 3 |
| | • moderate intensity | 2 |
| | • high intensity | 1 |
| • Wetland Water Regime | • wet: permanently flooded, intermittently exposed, semipermanently flooded | 3 |
| | • drier: seasonally flooded, temporarily flooded, saturated | 1 |
| • Microrelief of Wetland Surface | • pronounced | 3 |
| | • well developed | 2 |
| | • poorly developed | 1 |
| | • absent | 0 |
| • Number of Wetland types and Relative Proportions | • 5 or more types | 3 |
| | • 3-4 types | 2 |
| | • 1-2 types | 1 |
| | • no vegetation | 0 |
| | • even distribution | 3 |
| | • moderately even distribution | 2 |
| | • highly uneven distribution | 1 |
| | • no vegetation | 0 |
| • Vegetation Interspersion | • high interspersion | 3 |
| | • moderate interspersion | 2 |
| | • low interspersion | 1 |
| | • no vegetation | 0 |
| • Number of Layers and Percent Cover | • 5 or more layers | 3 |
| | • 3-4 layers | 2 |
| | • 1-2 layers | 1 |
| | • no vegetation | 0 |
| | • layers well developed (>50% cover) | 3 |
| | • layers with moderate cover (26-50% cover) | 2 |
| | • layers poorly distinguishable (<25% cover) | 1 |
| | • no vegetation | 0 |

(continued)

## 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna (Continued)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| • Interspersion of Vegetation Cover and Open Water | • 26-75% scattered or peripheral | 3 |
| | • >75% scattered or peripheral | 2 |
| | • <25% scattered or peripheral | 1 |
| | • 100% cover or open water | (1) |
| | • no vegetation | 0 |
| • Size | • large (>100 acres) | 3 |
| | • medium (10-100 acres) | 2 |
| | • small (<10 acres) | (1) |
| • Wetland Juxtaposition | • other wetlands within 400 m and connected above or below | (3) |
| | • other wetlands within 400 m but not connected | 1 |
| | • wetland isolated | 0 |

Slope Wetlands:

Model Range: 4-33

Functional Capacity Index = $\frac{\text{Total Score}}{33}$

Index Range: 0.12-1.0

All Other HGM Types:

Total Score: 16 17

Model Range: 4-36

Functional Capacity Index = $\frac{\text{Total Score}}{36}$

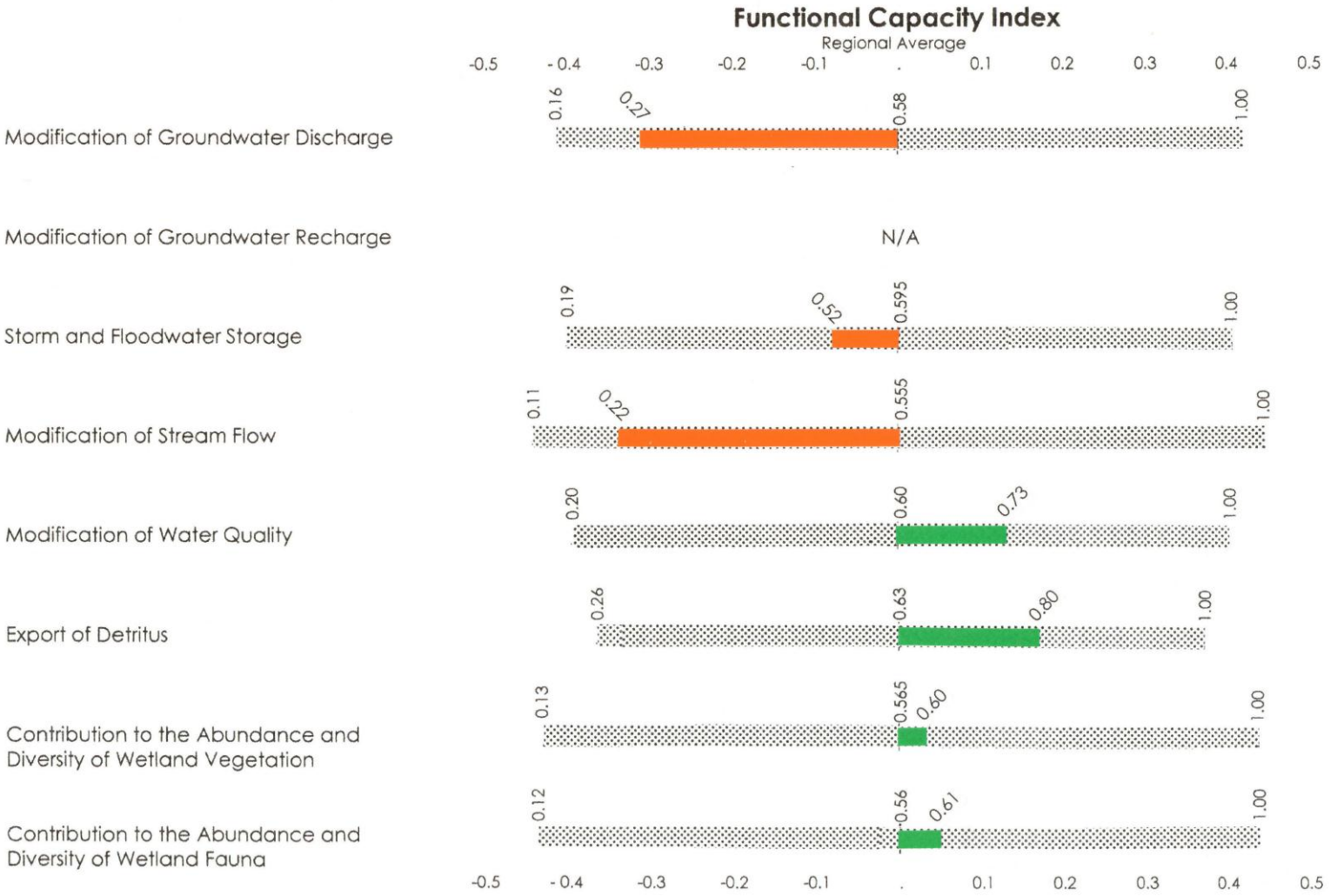
Index Range 0.11-1.0

$\frac{16}{36} = 0.44$

$\frac{17}{36} = 0.47$

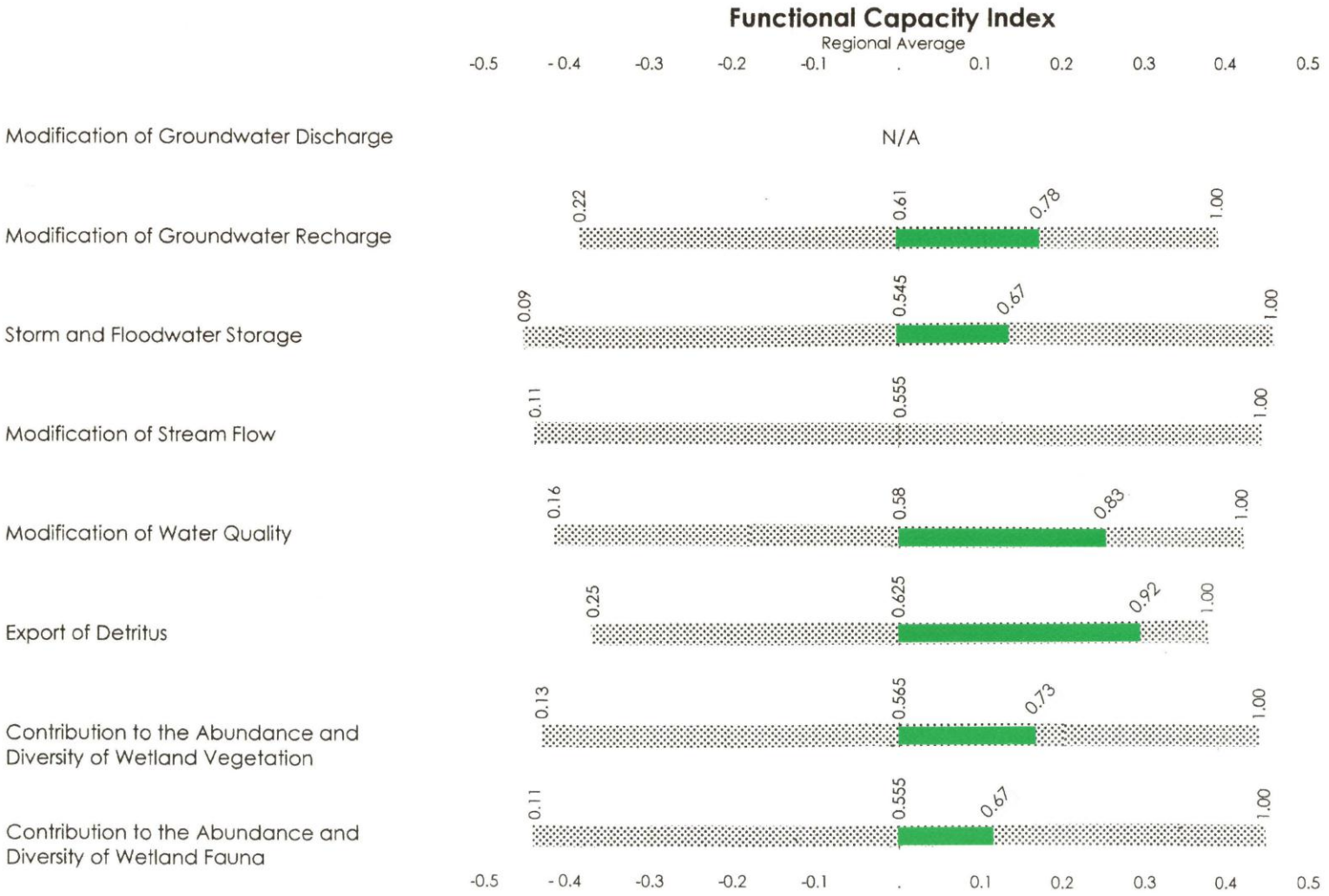
**Croton Reservoir South** **Sloping Wetland** **Study Area: CRS-3**

0.36 ac. - 47% of total 0.78 ac. wetlands



**Croton Reservoir South** **Lacustrine Fringe Wetland** **Study Area: CRS-3**

0.41ac. - 53% of total 0.78 ac. wetlands



# WETLAND INVENTORY DATA

LACUSTRINE FRINGE 0.41 ac
SLOPE 0.36 ac
0.78 ac

Project Number: YORKTOWN
Date:
Wetland Number: CRS-3
Aerial Photo Numbers:
USGS Quadrangle: OSSINING
Field Investigators: ED

## PART 1 - CHARACTERIZATION of WETLAND

### SURFACE WATER FLOW VECTORS

| Condition | Percent/Acreage | |
|---|---|---|
| | | Depressional |
| | 47% | Slope |
| | | Flat |
| | | Extensive Peatland |
| | 53% | Lacustrine Fringe |
| | | Riverine |

### VEGETATION TYPES

| Type | Percent/Acreage |
|---|---|
| Forested Wetland | |
| Evergreen | |
| Needle-leaved | |
| Deciduous | |
| Broad-leaved | 60% |
| Needle-leaved | |
| Scrub Shrub | |
| Evergreen | |
| Broad-leaved | |
| Needle-leaved | |
| Deciduous | |
| Broad-leaved | |
| Needle-leaved | |
| Emergent Wetland | |
| Persistent | 40% |
| Non-persistent | |
| Aquatic Bed | |
| Total | |

### SOIL TYPES

Histosol
- Fibric ☐
- Hemic ☐
- Sapric ☐

Mineral Hydric Soil
- Gravelly ☐
- Sandy ☒
- Silty ☐
- Clayey ☐

### GEOLOGY

Surficial:

Bedrock:

Comments: RESERVOIR IS MAN-MADE LIKE W/ SIGNIFICANT CONTROL OF WATER LEVEL EXCERCIZED BY NYC

### PLANT SPECIES

| | OW | FW | F | FU | OU | DOM | COM | OCC | C | S | TS | LS | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RED MAPLE | | | | | | ■ | | | ■ | | | | |
| AMERICAN ELM | | | | | | | ■ | | ■ | | | | |
| SWEET BIRCH | | | | | | | ■ | | ■ | | | | |
| BIGTOOTHED ASPEN | | | | | | | ■ | | ■ | | | | |
| GRAY BIRCH | | | | | | | ■ | | ■ | | | | |
| SPICEBUSH | | | | | | | ■ | | | ■ | | | |
| SPECKLED ALDER | | | | | | | ■ | | | ■ | | | |
| MULTIFLORA ROSE | | | | | | | ■ | | | | ■ | | |
| JAPANESE HONEYSUCKLE | | | | | | ■ | | | | | ■ | | |
| MUSTARD GARLIC | | | | | | ■ | | | | | | | ■ |
| ONION GRASS | | | | | | | ■ | | | | | | ■ |
| GRAPE | | | | | | | ■ | | | | | | ■ |
| ORIENTAL BITTERSWEET | | | | | | ■ | | | | | | | ■ |
| SKUNK CABBAGE | | | | | | ■ | | | | | | | ■ |
| MOSSES | | | | | | ■ | | | | | | | ■ |
| BLACKBERRY | | | | | | | ■ | | | | | ■ | |
| WINTERBERRY | | | | | | | ■ | | | | | ■ | |

| | |
|---|---|
| OW | Obligate Wetland |
| FW | Facultative Wetland |
| F | Facultative |
| FU | Facultative Upland |
| OU | Obligate Upland |
| DOM | Dominant |
| COM | Common |
| OCC | Occasional |
| C | Canopy |
| S | Sapling |
| TS | Tall Shrub |
| LS | Low Shrub |
| H | Herb |

### PRE-EMPTIVE STATUS

- ____ Public ownership
- ____ Wildlife management area
- ____ Fisheries management area
- ____ Designated State or Federal protected wetland
- ____ Documented habitat for state or federal listed species
- ____ Regionally scarce wetland category
- ____ Historic/archaeologic area

# WETLAND INVENTORY DATA (continued)

## PART 2 - CHARACTERIZATION of MODEL VARIABLES

### LANDSCAPE VARIABLES

**Size:**
- [■] Small (<10 acres)
- [ ] Medium (10-100 acres)
- [ ] Large (>100 acres)

**Wetland Juxtaposition:**
- [■] Connected Upstream and Downstream
- [ ] Only Connected Above
- [■] Only Connected Below
- [ ] Other Wetlands Nearby but not Connected
- [ ] Wetland Isolated

**Fire Occurence and Frequency:**
- [ ] Natural; Predictable Frequency
- [ ] Natural; Sporadic Frequency
- [ ] Human-caused; Predictable
- [ ] Human-caused; Sporadic
- [ ] Rare Event
- [■] No Evidence

**Regional Scarcity:**
- [■] Not Scarce (>5% of total wetland area of region)
- [ ] Scarce (<5% of total wetland area of region)

**Watershed Land Use:**
- [ ] > 50% urbanized
- [ ] 25-50% urbanized
- [■] 0-25% urbanized

### HYDROLOGIC VARIABLES

**Surface Water Level Fluctuation of Wetland:**
- [ ] High Fluctuation
- [■] Low Fluctuation
- [■] Never Inundated

**Frequency of Overbank Flooding:**
- [ ] Return Interval > 5 yrs.
- [ ] Return Interval 2-5 yrs.
- [■] Return Interval 1-2 yrs.
- [■] No Overbank Flooding

**pH:**
- [ ] Acid <5.5
- [■] Circumneutral 5.5-7.4
- [ ] Alkaline >7.4
- [ ] No Water

**Surficial Geologic Deposit Under Wetland**
- [ ] Low Permeability Stratified Deposits
- [ ] High Permeability Stratified Deposits
- [■] Glacial Till

**Wetland Land Use:**
- [ ] High Intensity (ie. agriculture)
- [ ] Moderate Intensity (ie. forestry)
- [■] Low Intensity (ie. open space)

**Wetland Water Regime:**
- [ ] Wet: Perm Flooded, Intermittently Exposed, Semiperm. Flooded
- [■] Drier: Seasonally Flooded, Temporarily Flooded, Saturated

**Basin Topographic Gradient:**
- [■] High Gradient >2%
- [ ] Low Gradient <2%

**Degree of Outlet Restriction:**
- [■] Restricted Outflow
- [■] Unrestricted Outflow
- [ ] No Outflow

**Ratio of Wetland Area to Watershed Area:**
- [ ] High >10%
- [■] Low <10%

**Microrelief of Wetland Surface:**
- [ ] Pronounced >45 cm
- [ ] Well Developed 15-45 cm
- [■] Poorly Developed <15 cm
- [■] Absent

**Inlet/Outlet Class:**
- [ ] No Inlet/No Outlet
- [ ] No Inlet/Intermittent Outlet
- [ ] No Inlet/Perennial Outlet
- [ ] Intermittent Inlet/No Outlet
- [ ] Intermittent Inlet/Intermittent Outlet
- [ ] Intermittent Outlet/Perennial Outlet
- [ ] Perennial Inlet/No Outlet
- [ ] Perennial Inlet/ Intermittent Outlet
- [■] Perennial Inlet/Perennial Outlet

**Nested Piezometer Data:**
- [ ] Recharge
- [ ] Discharge
- [ ] Horizontal Flow
- [■] Not Available

**Relationship of Wetlands' Substrate Elevation to Regional Piezometric Surface:**
- [ ] Piez. Surface Above or at Substrate elev.
- [ ] Piez. Surface below Substrate elev.
- [■] Not Available

**Evidence of Sedimentation:**
- [ ] No Evidence Observed
- [ ] Sediment Observed on Wetland Substrate
- [■] Fluvaquent Soils

**Evidence of Seeps and Springs:**
- [■] No Seeps or Springs
- [ ] Seeps Observed
- [ ] Perennial Spring
- [ ] Intermittent Spring

### SOIL VARIABLES

**Soil Lacking:**
- [ ]

**Histosol:**
- [ ] Fibric
- [ ] Hemic
- [ ] Sapric

**Mineral Hydric Soil:**
- [ ] Gravelly
- [■] Sandy
- [ ] Silty
- [ ] Clayey

### VEGETATION VARIABLES

**Vegetation Lacking:**
- [ ]

**Dominant Wetland Type:**
- [ ] Forested - Evergreen - Needle-leaved
- [ ] Forested - Deciduous - Broad-leaved
- [ ] Forested - Deciduous - Needle-leaved
- [ ] Scrub Shrub - Evergreen - Broad-leaved
- [ ] Scrub Shrub - Evergreen - Needle-leaved
- [ ] Scrub Shrub - Deciduous - Broad-leaved
- [ ] Scrub Shrub - Deciduous - Needle-leaved
- [ ] Emergent - Persistent
- [ ] Emergent - Non-persistent
- [ ] Aquatic Bed

**Number of Types & Relative Proportions:**

| Number of Types | Evenness of Distribution |
|---|---|
| [ ] Actual # | [ ] Even Distribution |
| [ ] 5 | [ ] Moderately Even Distribution |
| [ ] 4 | [■] Highly Uneven Distribution |
| [■] 3 | |
| [■] 2 | |
| [ ] 1 | |

**Vegetation Density/Dominance:**
- [ ] Sparse (0-20%)
- [ ] Low Density (20-40%)
- [ ] Medium Density (40-60%)
- [■] High Density (60-80%)
- [ ] Very High Density (80-100%)

**Vegetative Interspersion:**
- [■] High (small groupings, diverse and interspersed)
- [■] Moderate (broken irregular rings)
- [ ] Low (large patches, concentric rings)

**Number of Layers and Percent Cover:**

| Number of Layers | % Cover |
|---|---|
| [ ] 6 or > (actual #) | 1. submergents: |
| [■] 5 | 2. floating: |
| [ ] 4 | 3. moss-lichen: |
| [ ] 3 | 4. short herb: |
| [ ] 2 | 5. tall herb: |
| [ ] 1 | 6. dwarf shrub: |
| | 7. short shrub: |
| | 8. tall shrub: |
| | 9. sapling: |
| | 10. tree: |

**Plant Species Diversity:**
- [■] Low 1-2 plots sampled
- [ ] Medium 3-4 plots sampled
- [ ] High 5 or more plots sampled

**Proportion of Animal Food Plants:**
- [ ] Low (5-25% cover)
- [■] Medium (25-50% cover)
- [ ] High (>50% cover)

**Cover Distribution:**
- [■] Continuous Cover
- [ ] Small Scattered Patches
- [ ] 1 or More Large Patches; Parts of Site Open
- [ ] Solitary, Scattered Stems

**Dead Woody Material:**
- [ ] Abrundant (>50 of wetland surface)
- [ ] Moderately Abrundant (25-50% of surface)
- [■] Low Abrundance (0-25% of surface)

**Interspersion of Cover and Open Water:**
- [ ] 26-75% Scattered or Peripheral
- [ ] >75% Scattered or Peripheral
- [ ] <25% Scattered or Peripheral
- [■] 100% Cover or Open Water

**Stream Sinuosity:**
- [ ] Highly Convoluted (index 1.50 or >)
- [ ] Moderately Convoluted (index 1.25-1.50)
- [ ] Straight/Slightly Irreg. (index) 1.10-1.25

**Presence of Islands:**
- [ ] Several to Many
- [ ] One or Few
- [ ] Absent

CLS-3 LACUSTRINE FRINGE 0.41 ac (53%)
SLOPE 0.36 ac (47%)
0.78 ac

## 2.9.1 Modification of Ground Water Discharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | |
| • Inlet/Outlet Class | • perennial inlet/no outlet | 0 | 0 | 0 | 0 |
| • Nested Piezometer Data | • recharge condition | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezo-metric Surface | • wetland substrate elevation above piezometric surface | 0 | 0 | 0 | 0 |
| Direct Indicators of Function | | | | | |
| • Presence of Springs and Seeps | • evidence of perennial seeps or springs | 18 | 15 | 15 | 18 |
| • Nested Piezometer Data | • discharge condition | 18 | 15 | 15 | 18 |
| • Relationship to Regional Peizometeric Surface | • wetland substrate elevation below piezometric surface | 18 | 15 | 15 | 18 |
| • Inlet/Outlet Class | • no inlet/perennial outlet | 18 | 15 | 15 | 18 |
| Primary Variables | | | | | |
| • Microrelief of Wetland Surface | • pronounced | 3 | 3 | 3 | 3 |
| | • well developed | 2 | 2 | 2 | 2 |
| | • poorly developed | 1 | 1 | 1 | 1 |
| | • absent | 0 | 0 | 0 | 0 |
| • Inlet/Outlet Class | • perennial inlet/perennial outlet | 3 | 3 | 0 | 3 |
| | • intermittent inlet/perennial outlet | 2 | 2 | 0 | 2 |
| | • all other classes | 0 | 0 | 0 | 0 |
| • pH | • alkaline | 3 | 3 | 3 | 3 |
| | • circumneutral | 2 | 2 | 2 | 2 |
| | • acid | 0 | 0 | 0 | 0 |
| | • no water present | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • high permeability stratified deposits | 3 | 3 | 3 | 3 |
| | • low permeability stratified deposits | 2 | 2 | 2 | 2 |
| | • glacial till | 1 | 1 | 1 | 1 |
| • Wetland Water Regime | • wet; permanently flooded, intermittently exposed, semipermanently flooded | 3 | 0 | 3 | 3 |
| | • drier; seasonally flooded, temporarily flooded, saturated | 1 | 0 | 1 | 1 |

(continued)

## 2.9.1 Modification of Ground Water Discharge (Continued)

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | S | R | F |
|---|---|---|---|---|---|
| • Soil Type | • histosol | 3 | 3 | 3 | 3 |
| | • mineral hydric soil | 1 | (1) | 1 | 1 |
| | | – | – | – | – |
| | | | 4 | | |
| | Total Score: | | | | |
| | Model Range: | 3-18 | 2-15 | 3-15 | 3-18 |
| | Functional Capacity Index: | Total Score | 4 = 0,27 | — | — |
| | | 18 | 15 | 15 | 18 |
| | Index Range: | 0.19-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model can be applied to both year long and seasonal discharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a discharge mode for roughly half the year.

## 2.9.2 Modification of Ground Water Recharge

| VARIABLES | CONDITIONS HGM TYPES: | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|
| Indicators of Disfunction | | | | | | |
| • Inlet/Outlet Class | • no inlet/perennial outlet; intermittent inlet/perennial outlet | 0 | | | | 0 |
| • Nested Piezometer Data | • discharge condition | 0 | 0 | 0 | 0 | 0 |
| • Relationship to Regional Piezometric Surface | • wetland substrate elevation above or at piezometric surface | 0 | 0 | 0 | 0 | 0 |
| • Presence of Seeps and Springs | • presence of seeps or springs | 0 | 0 | 0 | 0 | 0 |

(continued)

## 2.9.2 Modification of Ground Water Recharge (Continued)

| VARIABLES | CONDITIONS HGM TYPES: | | WEIGHTS D | L | EP | R | F |
|---|---|---|---|---|---|---|---|
| Direct Indicators of Function | | | | | | | |
| • Inlet/Outlet Class | • | perennial inlet/no outlet | 21 | | | | 21 |
| • Nested Piezometer Data | • | recharge condition | 21 | | | | 21 |
| • Relationship to Regional Peizometeric Surface | • | wetland substrate elevation below piezometric surface | 21 | | | | 21 |
| Primary Variables | | | | | | | |
| • Microrelief of Wetland Surface | • | Poorly Developed | 3 | 3 | 1 | 3 | 3 |
| | • | Absent | 3 | 3 | 1 | 3 | 3 |
| | • | Well Developed | 2 | 2 | 2 | 2 | 2 |
| | • | Pronounced | 1 | 1 | 3 | 1 | 1 |
| • Inlet/Outlet Class | • | Perennial Inlet/Intermittent Outlet | 3 | 0 | 0 | 0 | 3 |
| | • | All Other Classes | 0 | 0 | 0 | 0 | 0 |
| • pH | • | Acid | 3 | 3 | 3 | 3 | 3 |
| | • | Circumneutral | 2 | 2 | 2 | 2 | 2 |
| | • | Alkaline | 1 | 1 | 1 | 1 | 1 |
| | • | No water present | 0 | 0 | 0 | 0 | 0 |
| • Surficial Geologic Deposit Under Wetland | • | Glacial Till | 3 | 1 | 1 | 1 | 3 |
| | • | Low Permeability Stratified Deposits | 2 | 2 | 2 | 2 | 2 |
| | • | High Permeability Stratified Deposits | 1 | 3 | 3 | 3 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • | High Fluctuation | 3 | 3 | 0 | 3 | 3 |
| | • | Low Fluctuation | 2 | 2 | 0 | 2 | 2 |
| | • | Never Inundated | 1 | 1 | 0 | 1 | 1 |
| • Wetland Water Regime | • | Drier: Seasonally Flooded, Temporarily Flooded, Saturated | 3 | 3 | 0 | 3 | 3 |
| | • | Wet: Permanently Flooded, Intermittently Exposed, Semipermanently Flooded | 1 | 1 | 0 | 1 | 1 |
| | | | — | — | — | — | — |
| • Soil Type | • | Gravelly or Sandy Mineral Hydric | 3 | 3 | 0 | 3 | 3 |
| | • | Silty or Clayey Mineral Hydric | 2 | 2 | 0 | 2 | 2 |
| | • | Sapric Histosol | 1 | 1 | 0 | 1 | 1 |
| | • | Fibric or Hemic Histosol | 0 | 0 | 3 | 0 | 0 |
| | | Total Score: | | 14 | | | |
| | | Model Range: | 4-21 | 4-18 | 2-12 | 4-18 | 4-21 |
| | | Functional Capacity Index: | Total Score / 21 | 14 / 18 = 0.78 | / 12 | / 18 | / 21 |
| | | Index Range: | 0.19-1.0 | 0.22-1.0 | 0.16-1.0 | 0.22-1.0 | 0.19-1.0 |

Note: This model should be applied to both year long and seasonal recharge wetlands.

If the wetland is seasonally fluctuating between recharge and discharge, then reduce the above score by one half (1/2), because the wetland only functions in a recharge mode for roughly half the year.

## 2.9.3 Storm and Flood-Water Storage

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | no outlet | | 27 | 21 | | | | 30 |
| Primary Variables | | | | | | | | |
| • Inlet/Outlet Class | • perennial inlet/intermittent outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent inlet/intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • no inlet/intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • non inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • intermittent inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| | • perennial inlet/perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Degree of Outlet Restriction | • restricted | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • unrestricted | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Basin Topographic Gradient | • low gradient | | 3 | 3 | 0 | 3 | 3 | 3 |
| | • high gradient | | 1 | 1 | 0 | 0 | 1 | 1 |
| • Wetland Water Regime | • Drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • Wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Surface Water Level Fluctuation of the Wetland | • high fluctuation | | 3 | 0 | 3 | 0 | 3 | 3 |
| | • low fluctuation | | 2 | 0 | 2 | 0 | 2 | 2 |
| | • never inundated | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Ratio of Wetland Area to Watershed Area | • large | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • small | | 1 | 1 | 1 | 0 | 1 | 1 |
| • Microrelief of Wetland Surface | • pronounced | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • well developed | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • poorly developed | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Frequency of Overbank Flooding | • overbank flooding absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | • return interval of >5 yrs | | 0 | 0 | 1 | 0 | 1 | 1 |
| | • return interval of 2-5 yrs | | 0 | 0 | 2 | 0 | 2 | 2 |
| | • return interval of 1-2 yrs | | 0 | 0 | 3 | 0 | 3 | 3 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |

(continued)

### 2.9.3 Storm and Flood-Water Storage (Continued)

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| • Dead Woody Material | • abundant | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderately abundant | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • absent | | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | — | — | — | — | — | — |
| | | Total Score: | | 11 | 14 | | | |
| | | Model Range: | 4-27 | 4-21 | 2-21 | 0-12 | 3-24 | 4-30 |
| | | Functional Capacity Index: | Total Score / 27 | 11/21 = 0.52 | 14/21 = 0.67 | — / 12 | — / 24 | — / 30 |
| | | Index Range: | 0.15-1.0 | 0.19-1.0 | 0.09-1.0 | 0-1.0 | 0.12-1.0 | 0.13-1.0 |

### 2.9.4 Modification of Stream Flow

(This model is identical for all HGM types)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Indicators of Disfunction | no outlet | 0 |
| Direct Indicators of Function | none | |

Primary Variables

| Storm and Flood Water Storage Function Model Score | | | Modification of Groundwater Discharge Function Model Score | | | |
|---|---|---|---|---|---|---|
| High* | 3 | x | High | 3 | = | 9 |
| Mod | 2 | x | High | 3 | = | 6 |
| Low | 1 | x | High | 3 | = | 3 |
| High | 3 | x | Mod | 2 | = | 6 |
| Mod | 2 | x | Mod | 2 | = | 4 |
| Low | 1 | x | Mod | 2 | = | 2 |
| High | 3 | x | Low | 1 | = | 3 |
| Mod | 2 | x | Low | 1 | = | 2 |
| Low | 1 | x | Low | 1 | = | 1 |

Total Score:

Model Range: 1-9

Functional Capacity Index: Total Score / 9

Index Range: 0.11-1.0

2/9 = 0.22 No GW discharge score for Lac. Fr.

*High = FCI of 0.67-1.0, Mod = FCI of 0.34-0.66, Low = FCI of 0-0.33 for the Storm and Flood Water Storage and Modification of Ground Water Discharge Function Model Scores.

## 2.9.5 Modification of Water Quality

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | none | | | | | | | |
| Direct Indicators of Function | evidence of sedimentation | | 18 | 15 | 12 | 12 | 12 | 18 |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • low intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • moderate intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • restricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • no outlet | | 2 | 0 | 0 | 0 | 0 | 2 |
| | • unrestricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Type | • no outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 2 | 2 | 0 | 0 | 0 | 2 |
| | • perennial outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Dominant Wetland Type | • forested wetland | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • scrub-shrub | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • emergent wetland | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • aquatic bed | | 1 | 0 | 0 | 0 | 0 | 0 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Cover Distribution | • forming a continuous cover | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • growing in small scattered patches | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • one or more large patches | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • solitary scattered stems | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • histosol or clayey soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • silty soil | | 2 | 2 | 2 | 0 | 2 | 2 |
| | • sandy or gravelly soil | | 1 | 1 | 1 | 0 | 1 | 1 |
| | | | — | — | — | — | — | — |
| | | Total Score: | | 11 | 10 | | | |
| | | Model Range: | 4-18 | 3-15 | 2-12 | 1-12 | 2-12 | 4-18 |
| | | Functional Capacity Index: | Total Score / 18 | 11 = 0.73 / 15 | 10 = 0.83 / 12 | — / 12 | — / 12 | — / 18 |
| | | Index Range: | 0.22-1.0 | 0.20-1.0 | 0.16-1.0 | 0.8-1.0 | 0.16-1.0 | 0.22-1.0 |

## 2.9.6 Export of Detritus

| VARIABLES | CONDITIONS | HGM TYPES: | WEIGHTS D | S | L | EP | R | F |
|---|---|---|---|---|---|---|---|---|
| Indicators of disfunction | no outlet | | 0 | 0 | | 0 | | 0 |
| Direct Indicators of Function | none | | | | | | | |
| Primary Variables | | | | | | | | |
| • Wetland Land Use | • moderate intensity | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • low intensity | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • high intensity | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Degree of Outlet Restriction | • unrestricted outflow | | 3 | 0 | 0 | 0 | 0 | 3 |
| | • restricted outflow | | 1 | 0 | 0 | 0 | 0 | 1 |
| • Inlet/Outlet Class | • perennial outlet | | 3 | 3 | 0 | 0 | 0 | 3 |
| | • intermittent outlet | | 1 | 1 | 0 | 0 | 0 | 1 |
| • Wetland Water Regime | • drier: seasonally flooded, temporarily flooded, saturated | | 3 | 3 | 3 | 0 | 3 | 3 |
| | • wet: permanently flooded, intermittently exposed, semipermanently flooded | | 1 | 1 | 1 | 1 | 1 | 1 |
| • Vegetation Density/Dominance | • high/very high | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • medium | | 2 | 2 | 2 | 2 | 2 | 2 |
| | • sparse/low | | 1 | 1 | 1 | 1 | 1 | 1 |
| | • no vegetation | | 0 | 0 | 0 | 0 | 0 | 0 |
| • Soil Type | • mineral hydric soil | | 3 | 3 | 3 | 3 | 3 | 3 |
| | • histosol | | 1 | 1 | 1 | 1 | 1 | 1 |
| | | Total Score: | — | 12 | 11 | — | — | — |
| | | Model Range: | 5-18 | 4-15 | 3-12 | 2-10 | 3-12 | 5-18 |
| | | Functional Capacity Index: | Total Score / 18 | 12 = 0.80 / 15 | 11 = 0.92 / 12 | 10 | 12 | 18 |
| | | Index Range: | 0.27-1.0 | 0.26-1.0 | 0.25-1.0 | 0.20-1.0 | 0.25-1.0 | 0.27-1.0 |

## 2.9.7 Contribution to Abundance and Diversity of Wetland Vegetation

(This model is identical for all HGM types)

| VARIABLES | | CONDITIONS | WEIGHTS |
|---|---|---|---|
| Indicators of Disfunction | | no vegetation | 0 |
| Direct Indicators of Function | | none | |
| Primary Variables | | | |
| • | Plant Species Diversity | • high diversity<br>• medium diversity<br>• low diversity | 5<br>3<br>1 |
| • | Vegetation Density/Dominance | • high/very high<br>• medium<br>• sparse/low | 5<br>3<br>1 |
| • | Wetland Juxtaposition | • connected upstream and downstream<br>• connected above or below<br>• other wetlands nearby but not connected (400 m or closer)<br>• isolated | 5<br>3<br>1<br>0 |
| | | Total Score: | 9 11 |
| | | Model Range: | 2-15 |
| | | Functional Capacity Index: | = Total Score / 15 |
| | | Index Range: | 0.13-1.0 |

$\frac{9}{15} = 0,60$

$\frac{11}{15} = 0,73$

### 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna

(This model is identical for all HGM types except Slope Wetlands for which "Interspersion of Vegetation Cover and Open Water" does not apply))

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| Direct Indicators of Disfunction | none | |
| Direct Indicators of Function | none | |
| Primary Variables | | |
| • Watershed Land Use | • low intensity (0-25% urbanized) | 3 |
| | • moderate intensity (25-50% urbanized) | 2 |
| | • high intensity (>50% urbanized) | 1 |
| • Wetland Land Use | • low intensity | 3 |
| | • moderate intensity | 2 |
| | • high intensity | 1 |
| • Wetland Water Regime | • wet: permanently flooded, intermittently exposed, semipermanently flooded | 3 |
| | • drier: seasonally flooded, temporarily flooded, saturated | 1 |
| • Microrelief of Wetland Surface | • pronounced | 3 |
| | • well developed | 2 |
| | • poorly developed | 1 |
| | • absent | 0 |
| • Number of Wetland types and Relative Proportions | • 5 or more types | 3 |
| | • 3-4 types | 2 |
| | • 1-2 types | 1 |
| | • no vegetation | 0 |
| | • even distribution | 3 |
| | • moderately even distribution | 2 |
| | • highly uneven distribution | 1 |
| | • no vegetation | 0 |
| • Vegetation Interspersion | • high interspersion | 3 |
| | • moderate interspersion | 2 |
| | • low interspersion | 1 |
| | • no vegetation | 0 |
| • Number of Layers and Percent Cover | • 5 or more layers | 3 |
| | • 3-4 layers | 2 |
| | • 1-2 layers | 1 |
| | • no vegetation | 0 |
| | • layers well developed (>50% cover) | 3 |
| | • layers with moderate cover (26-50% cover) | 2 |
| | • layers poorly distinguishable (<25% cover) | 1 |
| | • no vegetation | 0 |

(continued)

## 2.9.8 Contribution to Abundance and Diversity of Wetland Fauna (Continued)

| VARIABLES | CONDITIONS | WEIGHTS |
|---|---|---|
| • Interspersion of Vegetation Cover and Open Water | • 26-75% scattered or peripheral | 3 |
| | • >75% scattered or peripheral | 2 |
| | • <25% scattered or peripheral | 1 |
| | • 100% cover or open water | (1) |
| | • no vegetation | 0 |
| • Size | • large (> 100 acres) | 3 |
| | • medium (10-100 acres) | 2 |
| | • small (< 10 acres) | (1) |
| • Wetland Juxtaposition | • other wetlands within 400 m and connected above or below | (3) |
| | • other wetlands within 400 m but not connected | 1 |
| | • wetland isolated | 0 |

22 24

Slope Wetlands:

Model Range: 4-33

Functional Capacity Index = $\frac{\text{Total Score}}{33}$

Index Range: 0.12-1.0

All Other HGM Types:

Total Score:

Model Range: 4-36

Functional Capacity Index = $\frac{\text{Total Score}}{36}$

Index Range 0.11-1.0

$\frac{22}{36} = 0.61$

$\frac{24}{36} = 0.67$