Instructions for Completing Visual Assessment Data Sheets

One of the main purposes in setting up a volunteer monitoring program is to get more eyes out into the watershed to see what is going on, in other words, to collect data. Volunteer Monitoring promotes a strong sense of stewardship. It is also helpful in gathering data on waterbodies that are currently not assessed by the Department or waterbodies where more water quality information is needed by data users. Whether that data is used by the volunteers at the local level to provide information to their municipality, at the watershed level to identify or follow-up on problem areas in need of attention, at the State level to identify impaired waterways or in a study to provide baseline information, it needs to be consistent and structured so that the people using it can easily understand it and compare data from different sites.

The data sheets for this Visual Assessment tool were developed after reviewing data collection sheets from several NJ volunteer monitoring groups, the Department's original "Water Watch" RATS (River Assessment Teams) volunteer monitoring programs, the Natural Resource Conservation Service's Stream Visual Assessment Protocol (SVAP) and the EPA's Rapid Bio-Assessment Protocol and Volunteer Monitoring Manual. This protocol is New Jersey specific.

There are four data sheets, the General Sheet, Monitoring Sheet, the Assessment Sheet and the Pipe/Drainage Ditch Inventory Sheet. In addition to these sheets, it is recommended that some form of a reference map, a hand drawn map, USGS topographic map or aerial photograph is used to mark the approximate locations of the reach and each notable feature. IMAP or other GIS tools will assist you as well.

The General Sheet is meant to determine where you are performing your assessment and the weather conditions surrounding your monitoring event. In the past, it has been difficult to determine where monitors have accessed their site, and where the monitors have walked. To insure the quality of your data, this sheet should be filled out completely. This sheet should be filled out in the field.

The Monitoring Sheet is meant to obtain specific information. All the information asked for on this sheet will allow for a more thorough investigation and description of the health of your stretch. This sheet is to be completed after your whole stretch has been walked and when you are still present at your site.

The Assessment Sheet is meant to obtain general information about the entire stretch you are monitoring and general information about the surrounding watershed. There are two sections to the sheet, **Assessment within 50 feet of the bank** and **Assessment within ¼ mile of the stream**. The Assessment within 50 feet of the bank can be filled out at your site. The Assessment within ¼ mile of your stream will need to be filled out as your drive, bike, or walk around your stream.

This sheet will be submitted for each monitoring event and is intended to be filled out prior to and after the assessment is performed. The Assessment Sheet will stay relatively the same from monitoring event to event. The data you will be collecting on this sheet is extremely useful to water quality data users within the NJDEP because it allows data users to assess streamside land use in a more frequent manner.

The Pipe/Drainage Ditch Inventory Sheet should be completed for each pipe and drainage ditch you find along your stretch. The pipe/ditch should also be marked on your reference map. There are many more pipes/ditches draining into our streams than we know. The data collected here is critical in determining point sources and nonpoint sources of pollution entering into the stream.

The following is a line-by-line explanation of how to fill out your data sheets, the techniques used for collecting the data, and the ways to obtain necessary information for your data sheets.

General Sheet

Segment ID/site name
This ID will be assigned to you by the Department and will be used to identify the stream segment. It may also be referred to as the stream id#. The number allows the Department to locate what water quality segment you are assessing.

Assessment # of the Year
This number is to distinguish different sampling events that have occurred on the same stream segment. In training, we have discussed that you should stream walk 4 to 6 times per year at the same time of year; once a season, after a high flow event and low flow event. For example, the first assessment # will be 1 of 6, the second, 2 of 6 and so on. *This will be auto-populated by the data system.*

Waterbody
The name of the stream can be determined from the USGS quadrangle maps, street maps, IMap or the Department. If no name is available the stream should be identified as an unnamed tributary to the nearest stream that the name is known. *This will be assigned to you by the Department.*

Watershed Management Area
This refers to one of the 20 Watershed Management Areas identified by the Department. See attached map, or this information can be obtained from IMap.

County
Write down the name of the county you are doing the assessment in.

Segment Identification
Segment Beginning: Take a GPS point at the starting point of your assessment
Segment End Point: Take a GPS point at the end point of your segment.
Record the Latitude and Longitude on your data sheet of each point.

If you do not have access to your GPS unit, you can identify latitude and longitude on a USGS topographic map or on IMap or the data management system.

Survey Team
Names of the people involved in the assessment.

Activity Time
Time of day when the assessment was performed.

Activity Date
Date on which the assessment was performed.

Weather Today
Fill in the appropriate number(s):
(1. Clear, 2. Partly Cloudy, 3. Overcast, 4. Light rain/Showers, 5. Steady Rain, 6. Heavy Rain, 7. Snow, 8. Heavy Snow Melt)
that best describes the weather conditions on the day of the assessment.

Days Since Last Rain
Weather can effect assessment interpretation, so it is important to record recent rainfall or drought conditions. If it has been less than a week since the last rain, check 'Days since last rain'; record the number of days since the last rainfall in the space provided. If it has been more than a week since the last rain, check one of the following: 'More than one week since last rain', OR 'More than one month since last rain'.

Current Temperature
Enter the air and water temperature in F degrees at the time of the assessment.

Site Sketch
This should be a hand drawn map of your stream segment. Your hand drawn map will allow you more room to add notes and mark such features as pools, riffles, runs, road crossings, transect locations, outfalls, ditches, stream confluences, flocks of waterfowl, etc. Please be sure to include anything you may see along your stream walk. You can scan your sketch in an electronic format or take a photo of your site sketch and submit it with your assessment

Monitoring Sheet

There are two predominate stream types, high gradient and low gradient. High gradient streams are found in areas that have some elevation above sea level like the Highlands or the Piedmont region. Low gradient streams are found in low-lying areas like the Coastal Plains or the Pinelands.

Your monitoring sheet results will depend upon if you are in a low or high gradient stream. Which type of stream you are monitoring will influence the types of data you can collect. For example, pool and riffle variability may not be a determination you can make if you are in a low gradient stream, however, in high gradient streams pools and riffles may be easy to assess.

Another factor that will affect your assessment is if the stream is wadeable or non-wabeable. A wadeable stream is one that you can safely enter into and stand in. The water level should not be higher than knee height and the velocity of the stream should be a safe rate. A non-wadeable stream is a stream in which the current in moving too fast or the depth of the stream is unsafe for you to walk in.

Stream Width

Stream width is one of the parameters that will vary based on low or high gradient status.

For Non-Wadeable Streams

Fill in the number that best identifies the overall reach.

1. *Constant* means that the width remains fairly uniform throughout the entire reach.
2. *Widening* means that the stream gradually but noticeably widens from upstream to downstream.
3. *Mild constrictions* mean that at one or more locations in the reach the stream narrows slightly then widens out again.
4. *Sharp constriction* means that at one or more locations in the reach the stream narrows to at least half the normal width of the stream and then widens out again.

For Wadable Streams

Use your surveyors tape measure to measure the width of the stream. Simply have one partner stay at the waters edge and the other partner walks directly across and record the measurement. Make sure you record the units you are using. Meter (M) is the unit of choice for the data management system. When conducting your assessment, keep in mind that depth, width, velocity and flow will be direct measurements that should be conducted along the same transects. You should consider the average width of your stream by walking the whole stretch first, then select areas that are accessible and representative of the stretch.

Record each width as **W_1, W_2**, etc, on your data sheet. The data system will allow you to record as many widths as you measured and will then give you an average.

Stream Depth

For Wadeable Streams

Stream depth should be measured along the same transect used for the stream width. You should measure at least once every foot for first and second order streams and once every five feet for streams third order or higher. Measurements should be taken. Record each measurement of your data sheet. The data system you will be entering this information into will allow you to enter in all the measurements and will then calculate the average.

For Non-Wadeable Streams you do not need to record depth.

Stream Velocity

For Wadeable Streams

First, measure stream velocity by marking off a 10 foot section of stream run, on a linear section of stream bank and with a stopwatch measure the time it takes a stick, orange, or any other biodegradable object to float the 10 feet section. Repeat 5 times using the same floating tool, in the same 10-foot section, and determine the average time. Divide 10 (the distance; D) by the average time (T) to determine velocity in feet per second (V=D/T).

For Non-Wadeable Streams you will need to document predominate stream velocity. Select either

1. *slow*
2. *moderate*
3. *fast*

Stream Flow

For Wadeable Streams

The data management system will calculate the stream flow based on the other measurements you have taken.

For Non-Wadeable Streams

This is referring to the flow appearance of the surface water of the stream. Fill in the number that best identifies the reach.

1. *Slow* means that when looking at the stream the water does not appear to be moving or is barely moving.
2. *Moderate* means that when looking at the stream, the water appears to be moving but the surface still appears flat.
3. *Swift* means that the water is moving fast and the surface of the water is not flat.
4. *Combination* means that the flow in the reach varies because the reach is made up of pools and riffles and/or constrictions that are causing ponding of the water.

Stream Depth/Velocity Combinations

Stream velocity and depth can greatly affect the aquatic life of a stream. The best available habitat includes all of the following combinations of velocity and depth combinations. Record all available combinations for both wadeable and non-wadeable streams.

Slow (<1ft/sec), shallow (<1.5ft)
Slow, deep
Fast, deep
Fast, shallow
Slow, shallow
EPA, Volunteer Stream Monitoring Manual. 1995

Channel Flow Status

The degree to which the channel is filled with water. The flow status will change as the channel enlarges (e.g., widening causes by erosion) or as flow decreases as a result of dams and other obstructions, diversion of flow, dry weather conditions or drought. When water does not cover much of the streambed, the amount of suitable substrate for aquatic organisms is limited.

1. *Base of both lower banks*
   Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.
2. *Greater than 75%-*
   Water fills >75% of the available channel; or <25% of channel substrate is exposed.
3. *25-75%*
   Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.
4. *Very little water*
   Very little water in channel and mostly present as standing pools.

In high-gradient streams, riffles and cobble substrate are exposed; in low-gradient streams, the decrease in water level exposes logs and snags, reduces the areas of good habitat for macroinvertabrate organisms. Channel flow is especially useful for interpreting biological condition under abnormal or lowered flow conditions. This parameter becomes important when more than one biological index period is used for surveys or the timing of sampling is inconsistent among sites or annual periodicity.

Channel Alteration

Signs of channelization or straightening of the stream may include an unnaturally straight section of a stream, high banks, or lack of flow diversity (pools, riffles, runs), uniform-sized stream substrate, vegetation may be missing or lacking diversity or missing woody vegetation.

1. *Stream with normal pattern*
2. *Some channelization present, usually in areas of bridges etc…*
3. *Channelization extensive, 40-80% of the streams reach*
4. *Over 80% of the stream channelized, gabion baskets and/or riprap, and/or concert present.*

Embeddedness

Embeddedness is the extent to which rocks (gravel, cobbles, and boulders) are sunken into the silt, sand, or mud of a stream bottom. Embeddedness is easier to identify in high gradient streams than in low gradient streams. To estimate the embeddedness, observe the amount of fine particles overlying, in between, and surrounding the rocks. Generally, the more that rocks are embedded the less rock surface or space between rocks is available as habitat for invertebrates and spawning fish.

To determine embeddedness pick up a rock within the stream. As you look at the side of the rock you will be able to see a line or discoloration that indicates where the sediment line was. There will be a difference in the color of the rock that was embedded and the color of the rock that was exposed.

1. *0-25% surrounded by sediment*
2. *26-50% surrounded by sediment*
3. *51-75% surrounded by sediment*
4. *75% or greater surrounded by sediment*

Pools and Riffles

Pools and riffles refer to the mixture of flows and depths that create in-stream habitat for invertebrates and fish. Pools are deeper than the average stream depth with slower moving water than the average flow appearance. Riffles are shallower depth areas of the stream segment with faster, turbulent water running over gravel and/or rocks. This description will be dependent upon the stream gradient. Pools and riffles are typical of healthy high gradient streams; you may not find noticeable defined pools or riffles in a low gradient stream.

Your choices are:

1. *Frequent occurrence*
2. *Infrequent occurrence*
3. *Occasional occurrence*
4. *Flat water*

Stream Sinuosity

Sinuosity refers to the natural tendency for a stream to meander.

1. *Straight-natural* means that the channel is fairly straight with no visible evidence of artificial bank stabilization.
2. *Straight-channelized* means that the channel is straight and has obviously been channelized with an artificial lining or bank stabilization.
3. *Slight Bends*
4. *Moderate Bends*
5. *Sharp bends (oxbows*)

Pool Variability

Rates the overall mixture of pool types found in streams, according to size and depth. The 4 basic types of pools are large-shallow, large-deep, small-shallow, and small-deep. A stream with many pool types will support a wide variety of aquatic species. Rivers with low sinuosity (few bends) and monotonous pool characteristics do not have sufficient quantities and types of habitat to support a diverse aquatic community. General guidelines are any pool dimension (i.e., length, width, oblique) greater than half the cross-section of the stream for separating large from small and 1 m depth separating shallow and deep.

1. *Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.*
2. *Majority of pools large-deep; very few shallow.*
3. *Shallow pools much more prevalent than deep pools.*
4. *Majority of pools small-shallow or pools absent.*

Predominate Stream Substrate

Low Gradient Only

Predominate stream substrate refers to the material on the stream bottom. You may have more than one type of material, but pick the dominant one for your stream segment and be sure to note the other types of substrate present.

Choose the number that best describes the predominant bottom in the reach. If the bottom is composed of some material not listed, note the material in the "other" space.

1. Mix with gravel and firm sand prevalent
2. Mix of soft sand, mud, clay, or silt
3. All mud or clay or sand bottom
4. Hard-pan clay or bedrock

Epifaunal Substrate Available Cover

This description changes depending on high gradient or low gradient status.

This is a measure of the relative quantity and variety of natural structures in the stream, such as cobbles, large rocks, fall trees, log and branches and undercut banks that are available to macroinvertebrates and fish as refuges, and for breeding and feeding. The abundance and variety of such structures provide habitat diversity and can support a diversity of organisms.

High Gradient Stream

1. *Greater than 70%* of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).

2. *40-70% mix of stable habitat*; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).

3. *20-40% mix of stable habitat*; habitat availability less than desirable; substrate frequently disturbed or removed.

4. *Less than 20% stable habitat*; lack of habitat is obvious; substrate unstable or lacking.

Low Gradient Stream

1. *Greater than 50%* of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).

2. *30-50% mix of stable habitat*; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).

3. *10-30% mix of stable habitat*; habitat availability less than desirable; substrate frequently disturbed or removed.

4. *10% stable habitat;* lack of habitat is obvious; substrate unstable or lacking.

Sediment in the Stream or Sediment Deposition
This description changes depending on high gradient or low gradient status.

High Gradient Streams

1. Little or no enlargement of islands or point bars and *less than 5%* of bottom affected by sediment deposition.
2. Some new increase in bar formation, mostly from gravel, sand or fine sediment: *5-30% of the bottom affected, slight deposition in pools*
3. Moderate deposition of new gravel, sand or fine sediment on old or new bars; *30-50% of the bottom affected*; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.
4. Heavy deposits of fine material, increased bar development; *more than 50%* of the bottom changing frequently; pools almost absent due to substantial sediment deposition

Low Gradient Streams

1. Little or no enlargement of islands or point bars and *less than 20%* of the bottom affected by sediment deposition.
2. Some new increase in bar formation, mostly from gravel, sand or fine sediment; *20-50%* of the bottom affected; slight deposition in pools.
3. Moderate deposition of new gravel, sand or fine sediment on old and new bars; *50-80%* of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.
4. Heavy deposits of fine material, increased bar development*; more than 80%* of the bottom changing frequently; pools almost absent due to substantial sediment deposition

Bank Stability Left and Right Bank

Bank Stability refers to the existence of or the potential for detachment of soils from the stream banks and its movement into a stream. Excessive bank erosion occurs when the watershed surrounding the stream has been altered. An example of this may be a newly constructed parking lot on the stream bank. Precipitation will hit the parking area and rush off site quickly and towards the stream and cause the stream flow to rapidly increase which may cause the banks to erode. Left and right bank is determined by looking up stream. Signs of erosion may include exposed tree roots, undercut banks, unvegetated banks, evidence of vehicles, grazing areas, and walking paths.
Pick the number that best describes what you see.

1. *Stable*-Evidence of erosion or bank failure absent or minimal; <5% of bank affected.
2. *Moderately Stable*-Small areas of erosion, mostly healed over; 5-30% of bank in reach has areas of erosion.
3. *Moderately Unstable*- 31-60% of bank in reach has areas of erosion, high erosion potential during flooding.
4. *Unstable*- Many eroded areas, “raw” areas frequent; obvious bank sloughing; 60% or > of bank erosion scars.

Riparian Vegetation

Riparian vegetation refers to the vegetation contiguous with the stream bank. It can be any type of natural vegetation and must consist of a good mix of vegetation including aquatic plants, sedges, rushes, grasses, forbs, shrubs, understory trees, and large trees. A healthy riparian zone is critical to a healthy stream. Again, left and right bank is determined by looking up stream. Pick the number that best describes what is observed on both banks. You will need to convert your answer into meters for the data management system.

1. *>50 ft width*
2. *35 - 50 ft width*
3. *15 - 35 ft width*
4. *< 15 ft width*

Left/Right Bank Vegetative Protection

The vegetation protecting the stream's banks and the near-stream portion of the riparian zone. The root systems of plants growing on stream banks help hold the soil in place, thereby reducing the amount of erosion that is likely to occur.

Looking upstream evaluate how much of the stream bank is covered by vegetation.

1.Greater than 90%
2.70-90%
3.50-70&
4.Less than 50%

Course Particulate Organic Matter (CPOM)

CPOM is organic matter in the stream that didn't come from biological activity occurring in the stream. Leaves and sticks that have entered into the stream channel are considered CPOM. Streams get a lot of their nutrients from CPOM, but too much of it can result in a nutrient overload. Rate the amount of material in the stream that you consider CPOM.

1. Abundant
2. Moderate
3. Rare

% Tree Canopy

Shading of a stream is important for cold water fish species like trout because it keeps the temperature of the stream down. The time of year and time of day you are performing your assessment can affect your result. You may need to visit the site in mid-summer to determine the full canopy cover. Try to visualize the tall overhanging treetops as they will look when they have their leaves on in the summer. If you are in a predominate evergreen forest you should be able to determine this anytime of year. Stand in the middle of the stream or at the stream's edge and look straight up toward the sky look over the center of the stream. Or some people find it useful to look at the reflection of the tree canopy on the stream. Use your best judgment in picking the number that best represents the estimated percentage of stream coverage. The data management system will ask you for a number instead of a number range.

1. *0-25%*
2. *26-50%*
3. *51-75%*
4. *75% or greater*

Stream Substrate Stability

This will help determine if the bottom of the stream is established or if new material is entering into the stream. While you are standing in the stream kick your feet around;

1. If you kick up a plume of fine particles and can move around the rocks easily the bottom is *loose.*
2. If your action does not kick up a large plume and you can feel the rocks are anchored, the bottom is *stable*.

Woody Debris

Woody debris is the organic matter fallen trees or tree limbs, that are in the stream. Woody debris can create in-stream habitat for invertebrates and fish. Too much woody debris can negetatively impact a stream by slowing down stream flow or by causing a barrier to fish movement. Pick the number that best describes what was observed.

1. *None*
2. *In spots*
3. *Heavy throughout reach*

Woody Debris

This description will give more detail about the woody debris. If the debris is free floating, it may have recently floated down stream and is not useable habitat. However, if the debris is established and attached it will provide habitat for invertebrates and fish.

1. *Free floating*
2. *Attached*

Predominant Aquatic Vegetation

Aquatic Vegetation is normal in streams. It provides food and habitat for aquatic life. However, excessive aquatic vegetation will affect the health of a stream. Plant respiration and decomposition uses dissolved oxygen in the water. If there are too many aquatic plants in the stream it may suffocate fish and other oxygen depended organisms because of the lack of dissolved oxygen.
Pick the number that best describes the predominant aquatic vegetation observed.

1. *Rooted Submerging* means the vegetation is completely underwater.
2. *Rooted Emergent* means vegetation is rooted in substrate and is partially exposed above the water surface.
3. *Rooted Floating* means vegetation is rooted into the substrate and is floating on top of the water surface, an example is a lily pad.
4. *Free Floating* means vegetation is not rooted or attached to anything, an example is duck weed.
5. *None*

Algae Growth

Algae growth is an evaluation of the density of the growth of algae in the stream and on the stream bed. Algae can provide shelter and food resources for fish and macroinvertebrates; however large populations of algae can limit the amount of oxygen available to organisms as well.

If absent, record "*absent*"; if present evaluate whether the growth is very obvious "*densely populated*" or *"sparse".*

Algae Location

The amount of algae in the stream will also affect the amount of available dissolved oxygen for aquatic life.

Pick the number that best describes where algae are located.

1. *None*
2. *On streambed*
3. *On surface*
4. *Both*

Algae Color

Pick the number that best describes the color of the predominate algae seen.

1. *Light Green*
2. *Dark Green*
3. *Brown*
4. *Other, note other color*

Structures

Bridges, culverts, weirs, and dams are all examples of in-stream human made structures that will affect the stream's health. Please mark the structures observed in the stream within the reach. Identify any other structures observed above and below your stretch.

Water Condition

This section is describing some basic fundamentals of water conditions without using a water quality test kit.

Odor

The odor of the stream will be dependant upon the time of year you are assessing. You may notice an anaerobic smell in the summer when the stream flow is slow and the temperature is warm. This may indicate the dissolved oxygen in the stream is low.

Fill in the number that best describes the general water odor along the reach of the stream.

1. *Normal*
2. *Sewage*
3. *Petroleum*
4. *Chemical*
5. *Anaerobic*
6. *Other*

Color

The natural color of the stream will be dependant upon what region you are assessing. For example, Pine Barren waterbodies are tea colored. This is caused by the ecosystem's chemistry.

Fill in the number that best describes the general watercolor along the reach of the stream**:**

1. *Clear*
2. *Tea*
3. *Milky*
4. *Muddy*
5. *Other*

Surface Coating

Fill in the number that best describes the general surface coating along the reach of the stream.

1. *None*
2. *Oily* this can be natural or petroleum based. To tell the two types apart move the surface water around with a stick or throw a rock into it. If the oily coating is natural it will break up (like a puzzle) and stay part. If the oily coating is petroleum based, it will break up but then quickly move back together (like salad oil in oil and vinegar after you shake it up it will always separate out again.)
3. *Foam* This can also be naturally occurring. One way that may help to tell the natural foam and the petroleum-based foam (usually soap or detergent) apart is by looking closely at the bubbles within the foam. If the bubbles have a noticeable iridescent shine to them, more than like it is not naturally occurring foam.
4. *Scum*
5. *Other*-please explain other

Other Observations

Fill in any other observations made about the reach. This can include wildlife observed, anything that appears out of the ordinary or information obtained by talking with local residents concerning the history of land use in the area. Observation locations should be marked on the map of the area that you prepare.

GPS reference location #'s

Assign a number to each GPS point or line and mark the location of the point on the working map.

Photo Reference #'s

Assign each photo taken a number, and mark the location and direction of the photo on the working map.

Pipe & Drainage Ditch Inventory Sheet

Outfall Pipe Reference #
Assign a reference number for each outfall that is observed and record it on the working map.

Location
Take a GPS Point of where the pipe is discharging into the stream

Pipe Diameter
Enter the estimated or measure the diameter of the pipe.

Type
Pick the number that best describes the type of discharge from the pipe.
Storm drain is a discharge is from storm sewers from an adjacent development or highway/road system.
Residential discharge is a pipe from a nearby home discharging water from a sump, drain or washer.
Industrial Discharge (NJPDES#) means a permitted industrial discharge. These discharges will be clearly marked in the field and should be identified prior to going out. The NJPDES permit number should be recorded here.
Combined Sewer Overflow is a sewer system that carries both sewage and stormwater runoff. Normally, its entire flow goes to a waste water treatment plant, but during a heavy storm, the volume of water may be so great as to cause overflows of untreated mixtures of stormwater and sewage into receiving waters.
Other is any other discharge that you observe whether or not you can identify the specific type.

Pipe Material
Pick the number that best describes the pipe material.

Pipe Location
Pick the number that best describes the location of the pipe in relation to the stream bank.
In Stream-the end of the discharge pipe is located at the bottom of the stream bank or in the channel.
In Stream Bank-the discharge pipe is coming out of the stream bank
Near Stream-discharge pipe is located at or slightly behind the top of bank and discharges down the bank.

Pipe Flow / Appearance
Pick the number that best describes the flow coming out of the pipe.

1. *None*
2. *Trickle*
3. *Intermittent*
4. *Steady*
5. *Heavy*

Is the stream bank at the outfall eroded?

1. *Yes*
2. *No*

Stream Channel Downstream

1. *Stable*
2. *Eroded*

Is the Stream bank at the outfall eroded? Enter *yes or no*.

Drainage Ditch

Drainage Ditch #: Assign a reference number for any drainage ditch found and record it on the working map.

Location
Take a GPS point at the point where the ditch enters the stream.

Ditch Lining
Pick the number that best defines the lining of the ditch.

Ditch Flow Pick the number that best describes the flow in the ditch.

Flow Appearance:
Pick the number that best describes the appearance of the flow in the ditch.

1. *Clear*
2. *Turbid*
3. *Oily*
4. *Foamy*
5. *Colored*

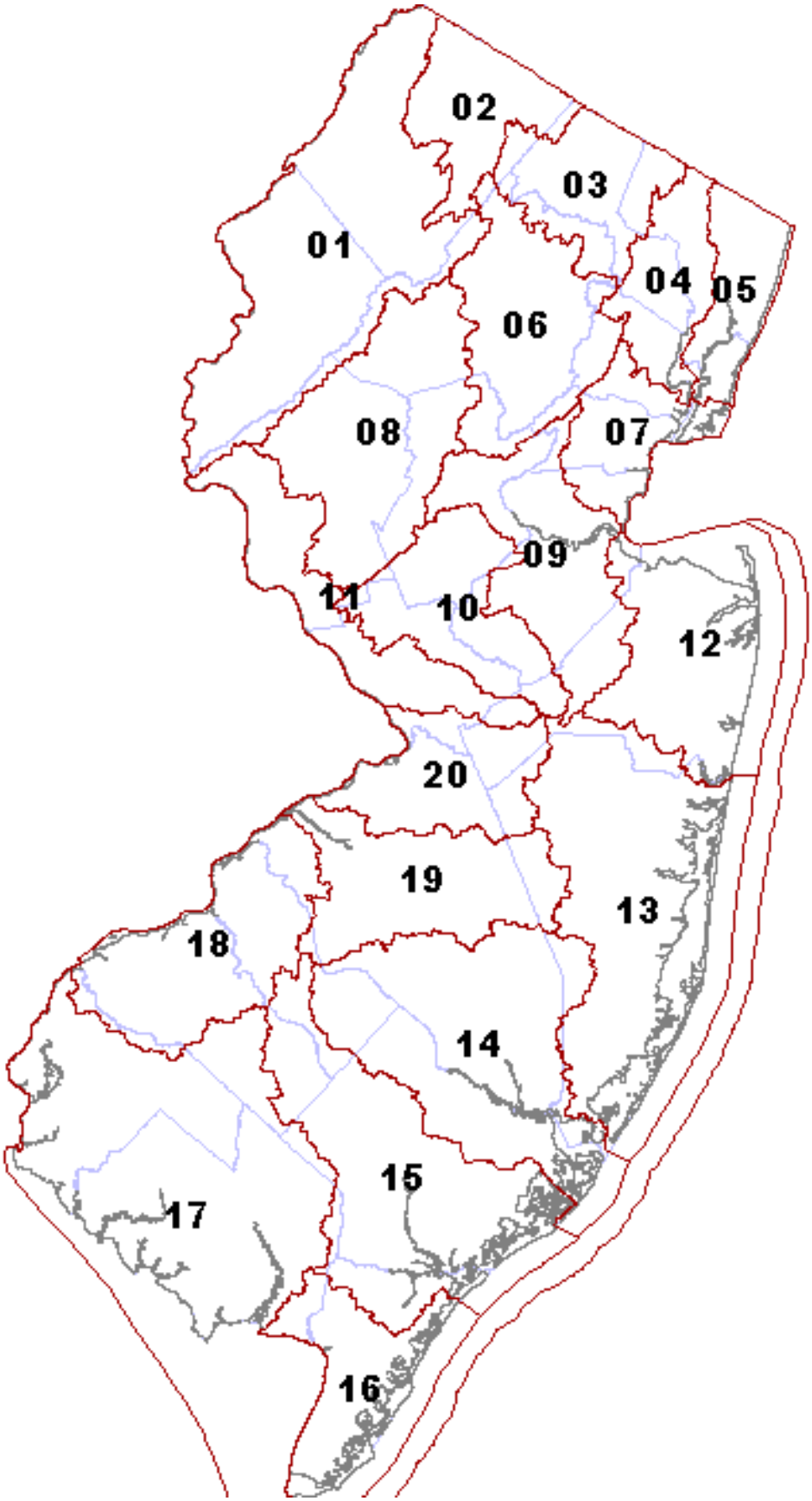
Stream Channel Downstream

1. *Stable*
2. *Eroded*

Other Observations
Enter any other observations that are made to further explain the information that was entered on this sheet or were not listed on this sheet.

Photo Reference #'s
Assign each photo taken a number and mark the location and direction of the photo on the working map.

GPS reference location #'s
Assign a number to each GPS point or line and mark the location of the point on the working map.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