

**Visual Assessment- High Gradient**  
*New Jersey Department of Environmental Protection*  
*Volunteer Monitoring Program*

**General Sheet**

**Site Name:** \_\_\_\_\_ **Site ID:** \_\_\_\_\_ **Watershed Management Area:** \_\_\_\_\_

**Waterbody Name:** \_\_\_\_\_ **County:** \_\_\_\_\_

**Segment Identification**

Beginning at Latitude/Longitude: \_\_\_\_\_

Estimate of Segment Length (aim for 100m): \_\_\_\_\_

**Survey Team:** \_\_\_\_\_

**Time:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Current Weather:** ☐ Clear ☐ Partly Cloudy ☐ Overcast ☐ Light Rain  
☐ Steady Rain ☐ Heavy Rain ☐ Snow ☐ Heavy Snow Melt

**Rainfall:**  
 Days since last rain: \_\_\_\_\_

**Air Temperature:** \_\_\_\_\_ °C

**Water Temperature:** \_\_\_\_\_ °C

**Water Conditions**

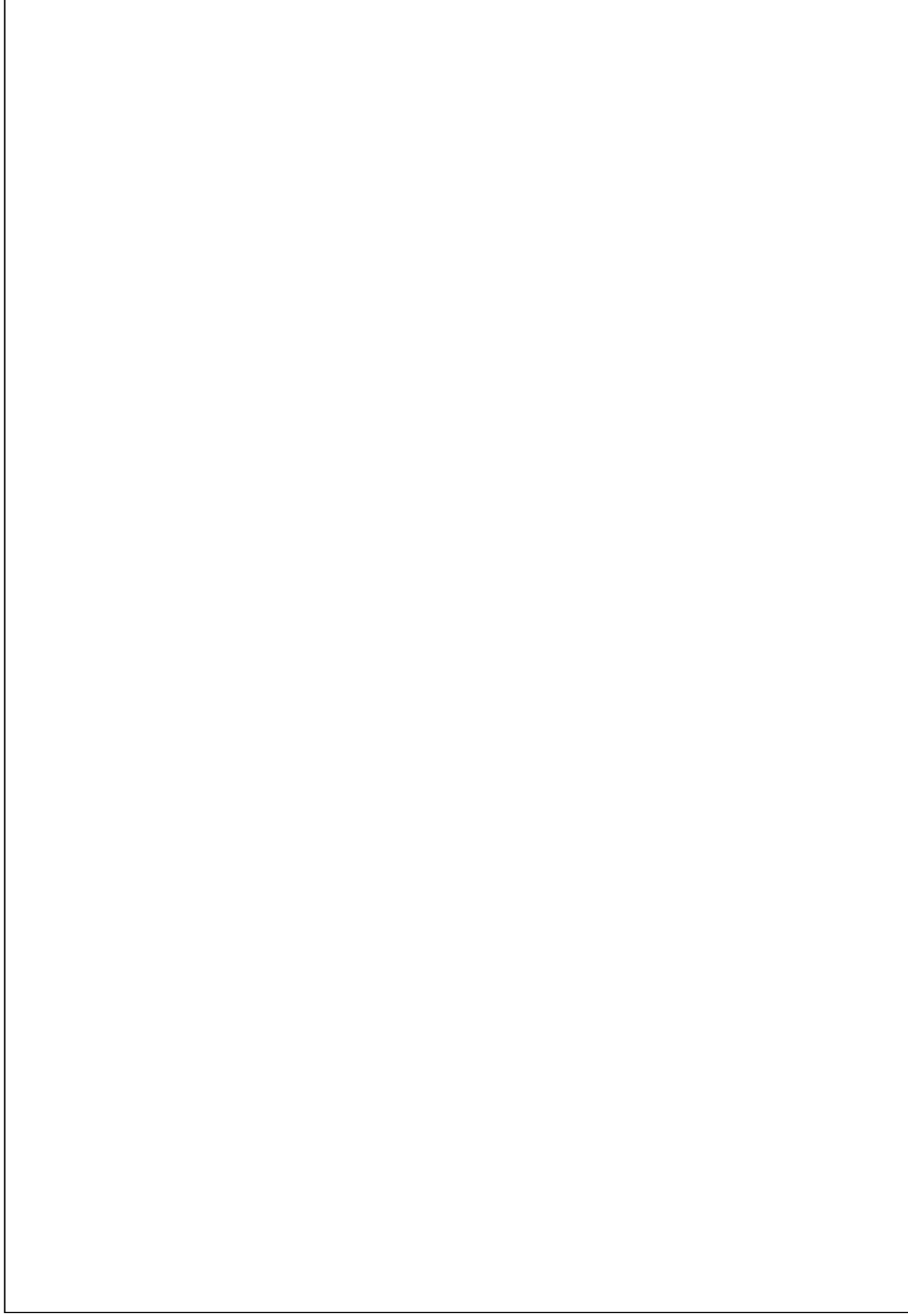
|                  |  |                                                                                  |
|------------------|--|----------------------------------------------------------------------------------|
| Odor:            |  | 1. Normal 2. Sewage 3. Petroleum 4. Chemical 5. Anaerobic (rotten eggs) 6. Other |
| Clarity:         |  | 1. Clear 2. Slightly turbid 3. Turbid                                            |
| Surface Coating: |  | 1. None 2. Oily 3. Foam 4. Scum 5. Other                                         |
| Stream Flow:     |  | 1. Slow 2. Moderate 3. Swift 4. Combination                                      |

**Stream Characteristics**

|                                 |         |                                                                                                      |      |       |  |
|---------------------------------|---------|------------------------------------------------------------------------------------------------------|------|-------|--|
| Stream Width:                   |         | _____, _____, _____, _____, _____                                                                    |      |       |  |
| Stream Depth:                   |         | _____, _____, _____, _____, _____                                                                    |      |       |  |
| Stream Velocity:                |         | _____, _____, _____, _____, _____ (V=D/T)                                                            |      |       |  |
| Canopy:                         |         | 1. Open   2. Mostly Open   3. Partly Open   4. Mostly Closed   5. Closed                             |      |       |  |
| Woody Debris:                   |         | 1. Abundant   2. Moderate   3. Rare                                                                  |      |       |  |
| Woody Debris:                   |         | 1. Free floating   2. Attached   3. Both                                                             |      |       |  |
| Predominant Aquatic Vegetation: |         | 1. Rooted emergent   2. Rooted submergent   3. Rooted floating   4. Free floating   5. No vegetation |      |       |  |
| Algae Growth:                   |         | 1. Abundant   2. Moderate   3. Rare   4. Absent                                                      |      |       |  |
| Predominant Algae Type:         |         | 1. Filamentous   2. Periphyton   3. None                                                             |      |       |  |
| Litter Concentration:           |         | 1. Present   2. Absent                                                                               |      |       |  |
| Structures:                     | Bridges | Culverts                                                                                             | Dams | Other |  |

2010-2011

**Site Sketch:** Include stream flow, roads, sampling locations, riffles, pools, runs, ditches, riprap, outfalls, photo and GPS reference #s

A large, empty rectangular box with a thin black border, intended for a site sketch. It occupies the majority of the page area below the header.

## High Gradient Monitoring Sheet

| Habitat Parameter                                                                                    | Condition Category                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                             |                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                      | Optimal                                                                                                                                                                                                                                                                                     | Suboptimal                                                                                                                                                                                                                                                                 | Marginal                                                                                                                                                                                                                                    | Poor                                                                                                                                                                                              |
| <b>1. Epifaunal Substrate/Available Cover</b>                                                        | 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). | 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 newfall, but not yet prepared for colonization (may rate at high end of scale).                | 20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.                                                                                                                          | Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.                                                                                                          |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>2. Embeddedness</b>                                                                               | Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space                                                                                                                                                           | Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.                                                                                                                                                                                              | Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.                                                                                                                                                               | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.                                                                                                              |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>3. Velocity/Depth Regimes</b>                                                                     | All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (slow is <0.3 m/s, deep is >0.5 m)                                                                                                                                                                 | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).                                                                                                                                                                   | Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).                                                                                                                                           | Dominated by 1 velocity / depth regime (usually slow-deep).                                                                                                                                       |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>4. Sediment Deposition</b>                                                                        | Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.                                                                                                                                           | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.                                                                                                         | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.   |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>5. Channel Flow Status</b>                                                                        | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.                                                                                                                                                                                                 | Water fills >75% of the available channel; or <25% of channel substrate is exposed.                                                                                                                                                                                        | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.                                                                                                                                                   | Very little water in channel and mostly present as standing pools.                                                                                                                                |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>6. Channel Alteration</b>                                                                         | Channelization or dredging absent or minimal; stream with normal pattern.                                                                                                                                                                                                                   | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.                                                                    | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.                                                                                          | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.                                                |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>7. Frequency of Riffles (or bends)</b>                                                            | Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.            | Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.                                                                                                                                                          | Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.                                                                                           | Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.                                                         |
| SCORE                                                                                                | 20 19 18 17 16                                                                                                                                                                                                                                                                              | 15 14 13 12 11                                                                                                                                                                                                                                                             | 10 9 8 7 6                                                                                                                                                                                                                                  | 5 4 3 2 1 0                                                                                                                                                                                       |
| <b>8. Bank Stability (score each bank)</b><br>Note: determine left or right side by facing upstream. | Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.                                                                                                                                                            | Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.                                                                                                                                                     | Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.                                                                                                                                    | Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.                                                 |
| SCORE ____ (LB)                                                                                      | Left Bank 10 9                                                                                                                                                                                                                                                                              | 8 7 6                                                                                                                                                                                                                                                                      | 5 4 3                                                                                                                                                                                                                                       | 2 1 0                                                                                                                                                                                             |
| SCORE ____ (RB)                                                                                      | Right Bank 10 9                                                                                                                                                                                                                                                                             | 8 7 6                                                                                                                                                                                                                                                                      | 5 4 3                                                                                                                                                                                                                                       | 2 1 0                                                                                                                                                                                             |
| <b>9. Bank Vegetative Protection (score each bank)</b>                                               | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, under story shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.       | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.                                 | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. |
| SCORE ____ (LB)                                                                                      | Left Bank 10 9                                                                                                                                                                                                                                                                              | 8 7 6                                                                                                                                                                                                                                                                      | 5 4 3                                                                                                                                                                                                                                       | 2 1 0                                                                                                                                                                                             |
| SCORE ____ (RB)                                                                                      | Right Bank 10 9                                                                                                                                                                                                                                                                             | 8 7 6                                                                                                                                                                                                                                                                      | 5 4 3                                                                                                                                                                                                                                       | 2 1 0                                                                                                                                                                                             |
| <b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>                            | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.                                                                                                                                                     | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.                                                                                                                                                                                   | Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.                                                                                                                                                       | Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.                                                                                                       |
| SCORE ____ (LB)                                                                                      | Left Bank 10 9                                                                                                                                                                                                                                                                              | 8 7 6                                                                                                                                                                                                                                                                      | 5 4 3                                                                                                                                                                                                                                       | 2 1 0                                                                                                                                                                                             |
| SCORE ____ (RB)                                                                                      | Right Bank 10 9                                                                                                                                                                                                                                                                             | 8 7 6                                                                                                                                                                                                                                                                      | 5 4 3                                                                                                                                                                                                                                       | 2 1 0                                                                                                                                                                                             |

HABITAT SCORE

| HABITAT SCORES | VALUE     |
|----------------|-----------|
| OPTIMAL        | 160 X 200 |
| SUB-OPTIMAL    | 110 X 159 |
| MARGINAL       | 60 X 109  |
| POOR           | < 60      |

## Assessment Sheet

| Streamside Land Use                             |                                    |               |          |                                                  |                                    |               |          |
|-------------------------------------------------|------------------------------------|---------------|----------|--------------------------------------------------|------------------------------------|---------------|----------|
|                                                 | Within 50 ft.<br>of top of<br>bank |               | Comments |                                                  | Within 50 ft.<br>of top of<br>bank |               | Comments |
|                                                 | Left<br>Bank                       | Right<br>Bank |          |                                                  | Left<br>Bank                       | Right<br>Bank |          |
| Residences                                      |                                    |               |          | Parking lots                                     |                                    |               |          |
| Maintained<br>Lawns                             |                                    |               |          | Athletic<br>Fields                               |                                    |               |          |
| Construction                                    |                                    |               |          | Marinas                                          |                                    |               |          |
| Residential<br>Pets&/or Pet<br>waste            |                                    |               |          | Waterfowl<br>(approx. #)                         |                                    |               |          |
| Dumping                                         |                                    |               |          | Sewage<br>Treatment                              |                                    |               |          |
| Commercial                                      |                                    |               |          | Preserved<br>Open Space                          |                                    |               |          |
| Roads Paved                                     |                                    |               |          | Stormwater<br>Basin                              |                                    |               |          |
| Roads<br>Unpaved                                |                                    |               |          | Wetlands                                         |                                    |               |          |
| Agricultural<br>Orchards                        |                                    |               |          | Cemetery                                         |                                    |               |          |
| Agricultural<br>livestock use                   |                                    |               |          | Recycling/<br>Waste<br>Facility                  |                                    |               |          |
| Agricultural<br>Pasture                         |                                    |               |          | Industrial<br>Plants                             |                                    |               |          |
| Agricultural<br>Feed Lots                       |                                    |               |          | Mines/<br>Quarries                               |                                    |               |          |
| Agricultural<br>Cropland                        |                                    |               |          | Other                                            |                                    |               |          |
| Inactive<br>Agricultural<br>Land / Fields       |                                    |               |          | Comments:<br><hr/> <hr/> <hr/> <hr/> <hr/> <hr/> |                                    |               |          |
| Golfing,<br>Resorts                             |                                    |               |          |                                                  |                                    |               |          |
| Camping                                         |                                    |               |          |                                                  |                                    |               |          |
| Swimming /<br>Fishing /<br>Canoeing/boa<br>ting |                                    |               |          |                                                  |                                    |               |          |
| Hiking / Paths                                  |                                    |               |          |                                                  |                                    |               |          |
| Horse Trails                                    |                                    |               |          |                                                  |                                    |               |          |

## Pipe &amp; Drainage Ditch Sheet

| Pipe # | Outfall pipe reference # | Pipe Diameter (in or ft) | Type: 1. Storm Drain 2. Residential Discharge 3. Industrial Discharge (include NJPDES #) 4. Combined Sewer Overflow 5. Other | Pipe Material: 1. Concrete 2. Steel 3. PVC 4. Clay 5. Other | Pipe Location: 1. In water 2. In bank 3. Near water | Pipe Flow: 1. None 2. Trickle 3. Intermittent 4. Steady 5. Heavy | Is stream bank at outfall eroded? (y/n) | Is stream bed eroded downstream? (y/n) |
|--------|--------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------|-----------------------------------------|----------------------------------------|
| 1      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 2      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 3      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 4      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 5      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 6      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 7      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 8      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 9      |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 10     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 11     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 12     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 13     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 14     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 15     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 16     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 17     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 18     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 19     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 20     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 21     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 22     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 23     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 24     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 25     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 26     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 27     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 28     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 29     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |
| 30     |                          |                          |                                                                                                                              |                                                             |                                                     |                                                                  |                                         |                                        |