


# Environmental Indicator Profile Sheet

	<p align="center"><b>Indicator Profile No. 8</b></p> <p align="center"><b>Physical Habitat Quality</b></p> <p align="center">Category: <b>Physical and Hydrological</b></p>	<p align="center"><b>Tools Used to Measure Indicator:</b></p> <ul style="list-style-type: none"> <li>• Rapid Bioassessment Protocols (Habitat Assess.)</li> <li>• Rapid Stream Assess. Technique (RSAT)</li> <li>• Lake Habitat Quality Index</li> </ul>
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**Description:**  
 Physical habitat evaluations are conducted to determine the potential of waterbodies to sustain aquatically healthy systems. Degradation is evaluated to assess whether or not habitat or water quality is the limiting factor to aquatic biodiversity. Specific measurements of streams include channel stability, channel cover, instream sediment embeddedness and substrate condition, riffle, run, pool structure, and riparian habitat. Lake and estuary measurements include: prevalence of submerged aquatic vegetation, percent littoral dominance, depth variation, substrate condition, shoreline development, and submerged structure.

**Utility of Indicator to Assess Stormwater Impacts:**

- Can help isolate and assess whether water quality or habitat is the limiting factor for aquatic biological health by evaluating what aquatic community might be expected to be present based on habitat alone.
- Can evaluate restoration potential based on the presence or absence of habitat characteristics.
- Can be used as the basis to enhance physical structure of a stream system to increase or maintain available habitat.
- Can help identify causes of degraded habitat (e.g., uncontrolled stormwater runoff).

**Advantages of Method:**

- Reasonably inexpensive and conducive to rapid assessment techniques.
- Reasonably easy to measure. Requires little specialized equipment and moderate training.
- Provides information on past, present, and potential future channel morphology when conducted over time.
- Useful in detecting the impacts of relatively low levels of development on stream habitat (e.g., trout streams).

**Disadvantages of Method:**

- May not accurately assess water quality impacts where habitat is in good condition but biological integrity is impaired.
- May be difficult to identify the sources of degraded habitat.
- Results may vary depending on the preferences and experience of the investigator.

**Indicator Useful for Assessing:**

- \* Aquatic Integrity of:
  - Lakes ●
  - Streams ●
  - Estuaries ●
- \* Land Use Impacts ●
- \* Stormwater Mgmt Programs ●
- \* Whole Watershed Quality ●
- \* Industrial Sites ○
- \* Municipal Programs ●

*Key:*

Very Useful ●

Mod. Useful ●

Not Useful ○

**Indicator Advantages**

- \* Geographic Range ●
- \* Baseline Control ●
- \* Reliable ●
- \* Accuracy ●
- \* Low cost ●
- \* Repeatable ●
- \* All Watershed Scale ●
- \* Familiar to Practitioners ●
- \* Easy to use & Low training ●

*Key*

Very Advantageous ●

Mod. Advantageous ●

Not Advantageous ○

**Cost**

See Table 3.3B

**Case Study: Maxted, J.R.; E.L. Dickey, G.M. Mitchell, 1994****Habitat Quality of Delaware Nontidal Streams**

From Delaware Section 305(b) Report, 1994, Appendix D

Habitat assessments were conducted at 189 sites throughout the state of Delaware during the fall of 1991 and 1993. Sampling stations were selected randomly to provide results which could be statistically extrapolated to the entire state. 87% of all nontidal streams in Kent and New Castle Counties and 78% of all perennial streams throughout the state were found to have degraded physical habitat. The majority of the degraded sites were severely degraded compared to reference conditions. In the Northern Piedmont region, the habitat degradation was caused primarily by urbanization and stormwater. Peak stormwater flows with erosive velocities have caused stream bank failure and channel substrate sedimentation. Management implications are presented. They include the need for aggressive compliance with the state's Sediment and Stormwater Control Regulations.

**Method References:**

- Rapid Bioassessment Protocols (Habitat Assessment): Plafkin, J.L.; M.T. Barbour, K.D. Porter, S.K. Gross, R.M. Hughes., 1989. *Rapid Bioassessment Protocols for use in Streams and Rivers Benthic Macroinvertebrates and Fish*. Report No. EPA/440/4--89/001.
- Rapid Stream Assessment Technique (RSAT): Galli, J. Unpublished Notes, Available through the Metropolitan Washington Council of Governments. 777 North Capitol Street, NE, Washington, D.C. 20002.
- Qualitative Habitat Quality Index (QHEI): Rankin, E. 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application. State of Ohio, Environmental Protection Agency. Columbus Ohio.