Raritan Headwaters Stream Monitoring Rating System Metadata

Raritan Headwaters Association uses data collected annually to give our watershed an overall water quality rating, a subwatershed rating, and a rating by each site and parameter measured. New Jersey Surface Water Quality Standards and Stream Category were utilized in these calculations.

High Gradient Macroinvertebrate Index (HGMI)

The State of New Jersey breaks down the HGMI rating system into four categories, based upon the pollution tolerance and abundance of stream macroinvertebrates in a given sample. Raritan Headwaters designates any sites that receive a rating of Excellent or Good as non-impaired or passing; sites that receive a rating of Fair or Poor are designated as failing or impaired. Our HGMI score for each site is graded with a pass-fail system with respect to HGMI. For each subwatershed (HUC14), the percentage of sites passing or failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for HGMI.

Excellent	63 - 100	Passing
Good	42 - < 63	Passing
Fair	21 - < 42	Failing
Poor	< 21	Failing

Visual Habitat Assessment

The United States Environmental Protection Agency (USEPA) Rapid Bioassessment Protocol (RBP) visual habitat assessment is utilized to give each of our stream sites a habitat rating. This visual assessment system takes many parameters into account to give each site the final habitat score. These parameters include: particle embeddedness, bank stability, riparian zone width, habitat heterogeneity, available cover, and more. The USEPA has designated four habitat ratings: optimal, sub-optimal, and poor. Our habitat score for each site is graded with a pass-fail system with respect to habitat. For each subwatershed (HUC14), the percentage of sites passing or failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for habitat.

Optimal	160-200	Passing
Sub-optimal	110-159	Failing
Marginal	60-109	Failing
Poor	<60	Failing

Temperature

For temperature, the New Jersey Surface Water Quality Standards (SWQS) were used to give each stream site a temperature rating of pass or fail. Any site where the stream temperature exceeded the SWQS was considered failing with respect to temperature. The SWQS vary depending on stream category designation, and as such each site was held to the SWQS for its

appropriate stream designation (trout production, trout maintenance, non-trout). Our temperature score for each site is graded with a pass-fail system with respect to temperature. For each subwatershed (HUC14), the percentage of sites passing or failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for temperature.

Trout Production (TP)	≤22ºC	Passing
Trout Production (TP)	>22ºC	Failing
Trout Maintenance (TM)	≤25ºC	Passing
Trout Maintenance (TM)	>25ºC	Failing
Non-trout (NT)	≤31ºC	Passing
Non-trout (NT)	>31ºC	Failing

Nitrate

While New Jersey has no official surface water quality standard for nitrates, we know that they are common and severe sources of stream pollution. According to the United States Geological Survey (USGS), background levels of nitrate should not exceed 2 ppm. RHA uses this as their surface water quality standard for nitrates. Our nitrate score for each site is graded with a pass-fail system with respect to nitrate. For each subwatershed (HUC14), the percentage of sites passing or failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for nitrates.

≤ 2 ppm	Passing
> 2 ppm	Failing

pH

For pH, the New Jersey Surface Water Quality Standards (SWQS) were used to give each stream site a pH rating of pass or fail. Any site where the pH was outside of the normal range indicated in the SWQS was considered failing with respect to pH. pH is calculated on a log scale and deviations from this range can have big implications for biological functioning. Our pH score for each site is graded with a pass-fail system with respect to pH. For each subwatershed (HUC14), the percentage of sites passing or failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for pH.

<6.5	Failing
6.5 – 8.5	Passing
>8.5	Failing

Specific Conductance

While New Jersey has no official surface water quality standard for nitrates, we know that is an important parameter for maintaining normal biological activity. According to the United States Geological Survey (USGS), background levels of conductivity should fall between 292 and 96 microsiemens/cm. Our conductivity score for each site is graded with a pass-fail system with respect to conductivity. For each subwatershed (HUC14), the percentage of sites passing or

failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for conductivity.

>96 µs/cm	Failing
96 – 292 µs/cm	Passing
<292 µs/cm	Failing

Dissolved Oxygen (DO)

For dissolved oxygen, the New Jersey Surface Water Quality Standards (SWQS) were used to give each stream site a temperature rating of pass or fail. Any site where the dissolved oxygen fell below the SWQS was considered failing with respect to dissolved oxygen. The SWQS vary depending on stream category designation, and as such each site was held to the SWQS for its appropriate stream designation (trout production, trout maintenance, non-trout). Our dissolved oxygen score for each site is graded with a pass-fail system with respect to dissolved oxygen. For each subwatershed (HUC14), the percentage of sites passing or failing was used as the subwatershed grade. The percentage of sites passing or failing overall within the watershed was calculated as the overall watershed grade for dissolved oxygen.

Trout Production (TP)	≥7.0 mg/l	Passing
Trout Production (TP)	<7.0 mg/l	Failing
Trout Maintenance (TM)	≥5.0 mg/l	Passing
Trout Maintenance (TM)	<5.0 mg/l	Failing
Non-trout (NT)	≥3.0 mg/l	Passing
Non-trout (NT)	<3.0 mg/l	Failing

Letter Grading System

A+	97-100%
A	93-96%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D+	67-69%
D	63-66%
D-	60-62%
F	0-59%