

Appendix C:

Habitat Analysis

Habitat Analysis

Both the quality and quantity of available habitat affects the macroinvertebrate community. A healthy biological community not only requires good water quality, but also a supporting habitat. The effect of habitat can be minimized by sampling in areas where habitats are similar. This way impacts to the biological community can be attributed to water quality.

Beginning with the 1993 study, each sampling station's habitat has been rated. There are two types of rating systems for 2008. One is for a riffle/run prevalent stream, like most of the streams in Monroe County, which incorporates three categories for a total of twelve parameters, whereas the parameters for the low gradient or glide/pool streams utilize 9 parameters. Only five sites in this study were evaluated using the latter system. The following is an explanation of the habitat parameters:

Habitat Parameter Descriptions

RIFFLE/RUN COMMUNITY

Substrate/Instream Cover

1. **Instream Cover:**

This is a measure of quantity and variety of natural structures in the stream that will provide a habitat for fish. This would include fallen trees, logs, and branches, undercut banks and large rocks. A wide variety of substrate will support greater diversity.

2. **Substrate for Benthic Macroinvertebrates:**

This measures the amount of hard substrate available for insects and snail habitat. Many insect larvae attach themselves to submerged substrate. Areas with rocky bottoms are critical for maintaining a healthy variety of insects.

3. **Embeddedness:**

This refers to the degree to which rocks are covered or sunken into the silt, sand or mud. As substrates become embedded in the stream bottom, the amount of adequate surface space for insects to attach themselves decreases and the quantity and quality of the macroinvertebrate community is predicted to decrease.

4. **Velocity/Depth Regime:**

There are four basic velocity/depth combinations:

- (1) Slow-deep
- (2) Slow-shallow
- (3) Fast-deep
- (4) Fast-shallow

General guidelines are as follows: 0.5 m separates deep from shallow: 0.3 m/s separates fast from slow. Streams that contain all four regimes are considered optimal.

Channel Morphology (form and structure)

5. **Channel Alteration:**

This parameter is a measure of changes to the shape of the stream channel. Streams that run through agricultural or urban areas may have been altered several times. When streams have been altered in any way (i.e., straightened, deepened, diverted, concrete channelized, artificial embankments or stabilization, dams or bridges), it can affect the macroinvertebrate community. Streams that have been altered provide fewer natural habitats for fish, macroinvertebrates and plants.

6. **Sediment Deposition:**

This parameter measures the sediment, which has accumulated on the stream bottom as a result of deposition. Deposition occurs as a result of large-scale movement of sediment caused by watershed erosion. This deposition may cause the formation of islands or point bars in the stream, which decreases the available habitat for macroinvertebrates.

7. **Frequency of Riffles:**

This parameter assumes that a stream with riffles or bends provides more diverse habitat than any straight or uniform depth stream. The ratio is calculated by dividing the average distance between riffles or bends by the average depth. The smaller ratio is an indicator of good habitat.

8. **Channel Flow Status:**

This is a measure of the degree to which the channel is filled with water. When the water reaches the base of both banks and a minimal amount of channel substrate is exposed, optimal conditions exist.

Riparian and Bank Structures

9. **Condition of Banks:**

This parameter addresses stream bank erosion (or potential for erosion). Steep banks are generally more susceptible to erosion and failure. Signs of erosion include crumbling and unvegetated banks and exposed tree roots and soil.

10. **Bank Vegetative Protection:**

This measures the amount of stream bank, which is covered by vegetation. Plant root systems on stream banks facilitate soil stability, which reduces the stream bank erosion. This parameter also provides information such as stream shading and nutrient uptake. Banks that support full natural plant growth are indicative for supporting a healthier habitat for macroinvertebrates and fish.

11. **Grazing Disruptive Pressure:**

This parameter measures the impact to the riparian zone, due to livestock grazing or human activities such as, urbanization, golf courses and residential developments.

12. **Riparian Zone Width:**

This is a measure of the width of the natural vegetation from the edge of the stream bank. This zone serves as a buffer to pollutants entering the stream from runoff and erosion. It also provides nutrients to the stream. An undisturbed riparian zone is reflective of a healthy stream, while a narrow riparian zone is not as healthy for a stream. Roads, parking lots, fields, lawns, rocks, bare soil or buildings near a stream bank have a detrimental effect on habitat.

Multihabitat (low gradient) community

Substrate/Instream Cover

1. **Epifaunal Substrate for Macroinvertebrates:**

The substrate in muddy bottom streams consists mostly of submerged logs, snags and aquatic vegetation.

2. **Pool Substrate Composition:**

This is an evaluation of the type and condition of bottom substrates found in pools. Firm sediment types such as gravel and sand as well as rooted aquatic plants support a wider variety of organisms. A pool substrate dominated by mud or bedrock will not support a diverse community. A variety of substrate is needed for a diverse community.

3. **Pool Variability:**

This parameter rates the overall mixture of pool types found in the streams. The four basic types of pools are:

- (1) Large-shallow
- (2) Large-deep
- (3) Small-shallow
- (4) Small-deep

General guidelines are as follows: greater than one half the cross-section to separate large from small and one meter separating shallow and deep.

Channel Morphology (form and structure)

4. **Sediment Deposition:**

This parameter measures the sediment, which has accumulated on the bottom as a result of deposition. Deposition occurs as a result of large-scale movement of sediment caused by watershed erosion. This deposition may cause the formation of islands or point bars in the stream, which decreases the available habitat for macroinvertebrates.

5. **Channel Flow Status:**

This is a determination of the percent of the channel that is filled with water. The flow status changes as the channel enlarges or as flow is decreased as a result of dams or obstructions, diversions for irrigation, or drought. When water does not cover as much of the streambed the available habitat is decreased.

6. **Channel Alteration:**

This parameter is a measure of changes to the shape of the stream channel. Streams that run through agricultural or urban areas may have been altered many times. When streams have been changed in any way (i.e., straightened, deepened, diverted, concrete channelized, artificial embankments or stabilization, dams or bridges) it can affect the macroinvertebrate community. Streams that have been altered have fewer natural habitats for fish, macroinvertebrates and plants.

Riparian and Bank Structure

7. **Bank Stability:**

This parameter addresses stream bank erosion (or potential for erosion). Steep banks are generally more susceptible to erosion and failure. Signs of erosion include crumbling and unvegetated banks and exposed tree roots and soil.

9. **Vegetative Protection:**

This measures the amount of stream bank, which is covered by vegetation. Plant root systems on stream banks facilitate soil stability, which reduces the stream bank erosion. Banks that support full natural plant growth are indicative for supporting a healthier habitat for macroinvertebrates and fish.

10. **Riparian Vegetative Zone Width:**

Refer to riffle/run definition.

Each sampling station's habitat is rated using the previously discussed parameters. Each parameter is scored from 0-20 as follows:

<u>Score</u>	<u>Category</u>
0-5	Poor
6-10	Marginal
11-15	Suboptimal
16-20	Optimal

Each parameter is added for a final habitat score for a particular station.

<u>Score</u>	<u>Score</u>	<u>Category</u>
Freestone riffle-run	Multihabitat	
0-60	0-44	Poor
72-120	45-89	Marginal
132-180	90-134	Suboptimal
192-240	135-180	Optimal

The habitat is a major factor in determining the potential of the aquatic community. A marginal or poor habitat is not expected to support the quantity and quality of macroinvertebrates that an optimal habitat will. The following tables are presented according to sampling order for the evaluated habitat assessments, which depict how each site scored according to the above categories per sampling procedure. Table 3 below, displays the habitat assessments for the past 3 years.

Habitat Results

Habitat Comparison				Habitat Comparison			
Site ID	2006	2007	2008	Site ID	2006	2007	2008
AQUACR11	*	*	137	LEHIRI02	185	183	184
AQUACR12	*	*	202	MARSCR08	175	192	173
BRODCR01	181	194	202	MARSCR09	171	193	163
BRODCR13	151	151	170	MARSCR10	*	*	218
BRODCR14	169	196	203	MARSCR11	*	*	171
BRODCR16	*	*	170	MARSCR12	*	*	178
BRODCR17	*	*	172	MARSCR13	*	*	178
BRODCR18	*	*	220	MCMICR20	*	*	151
BUCKCR01	162	168	179	MCMICR32	*	*	226
BUCKCR05	*	*	131	MCMICR30	157	177	191
BUCKCR06	*	*	144	MCMICR33	*	*	189
BUCKCR07	*	*	179	PARACR08	*	*	211
BUSHCR08	*	*	207	POCOCR14	158	192	205
BUSHCR09	*	*	208	POCOCR16	151	185	185
BUSHCR10	*	*	228	POCOCR17	177	174	180
CHERCR11	175	189	192	POCOCR18	175	185	190
CHERCR14	*	*	190	POCOCR20	199	209	230
CLEARU02	*	*	142	REDRU03	166	152	145
CRCRPO04	*	*	210	SCOTCR04	150	156	168
DEHOCR04	176	173	195	TANKCR02	*	*	193
DEHOCR05	*	*	202	TOBYCR01	192	182	192
DOTTCR04	*	*	163	TOBYCR14	177	186	189
DUPURU01	*	*	154	TOBYCR19	*	*	215
HAWKRU01	*	162	177	TOBYCR20	*	*	200
LAKECR01	*	*	174	TUNKCR03	200	208	227
LAKECR02	*	*	145	TUNKCR07	*	177	128
LEHIRI01	215	209	197	* No data			

BUSHCR08	
Habitat Summary	
Instream Cover	17
Substrate for Macroinvertebrates	16
Channel Alteration	19
Sediment Deposition	16
Channel Flow Status	16
Condition of Banks	15
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	20
Embeddedness	16
Velocity/Depth Regimes	16
Frequency of Riffles	18
Total Habitat Score	207

BRODCR14	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	18
Channel Alteration	15
Sediment Deposition	18
Channel Flow Status	20
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	19
Riparian Vegetative Zone Width	4
Embeddedness	18
Velocity/Depth Regimes	20
Frequency of Riffles	19
Total Habitat Score	203

BRODCR16	
Habitat Summary	
Instream Cover	14
Substrate for Macroinvertebrates	17
Channel Alteration	10
Sediment Deposition	15
Channel Flow Status	19
Condition of Banks	10
Bank Vegetative Protection	10
Grazing or Other Disruptive Pressure	10
Riparian Vegetative Zone Width	14
Embeddedness	16
Velocity/Depth Regimes	18
Frequency of Riffles	17
Total Habitat Score	170

BRODCR17	
Habitat Summary	
Instream Cover	17
Substrate for Macroinvertebrates	18
Channel Alteration	11
Sediment Deposition	14
Channel Flow Status	20
Condition of Banks	10
Bank Vegetative Protection	15
Grazing or Other Disruptive Pressure	7
Riparian Vegetative Zone Width	9
Embeddedness	15
Velocity/Depth Regimes	18
Frequency of Riffles	18
Total Habitat Score	172

MCMICR30	
Habitat Summary	
Instream Cover	14
Substrate for Macroinvertebrates	19
Channel Alteration	13
Sediment Deposition	16
Channel Flow Status	20
Condition of Banks	14
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	14
Riparian Vegetative Zone Width	10
Embeddedness	17
Velocity/Depth Regimes	16
Frequency of Riffles	20
Total Habitat Score	191

BRODCR18	
Habitat Summary	
Instream Cover	16
Substrate for Macroinvertebrates	18
Channel Alteration	18
Sediment Deposition	17
Channel Flow Status	20
Condition of Banks	20
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	19
Embeddedness	18
Velocity/Depth Regimes	19
Frequency of Riffles	18
Total Habitat Score	220

BRODCR13	
Habitat Summary	
Instream Cover	15
Substrate for Macroinvertebrates	6
Channel Alteration	20
Sediment Deposition	16
Channel Flow Status	16
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	20
Embeddedness	5
Velocity/Depth Regimes	14
Frequency of Riffles	4
Total Habitat Score	170

LAKECR02	
Habitat Summary	
Instream Cover	7
Substrate for Macroinvertebrates	4
Channel Alteration	20
Sediment Deposition	5
Channel Flow Status	17
Condition of Banks	15
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	18
Embeddedness	5
Velocity/Depth Regimes	8
Frequency of Riffles	8
Total Habitat Score	145

LAKECR01	
Habitat Summary	
Instream Cover	14
Substrate for Macroinvertebrates	15
Channel Alteration	16
Sediment Deposition	16
Channel Flow Status	15
Condition of Banks	15
Bank Vegetative Protection	17
Grazing or Other Disruptive Pressure	13
Riparian Vegetative Zone Width	5
Embeddedness	15
Velocity/Depth Regimes	16
Frequency of Riffles	17
Total Habitat Score	174

MCMICR32	
Habitat Summary	
Instream Cover	15
Substrate for Macroinvertebrates	18
Channel Alteration	20
Sediment Deposition	19
Channel Flow Status	20
Condition of Banks	19
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	18
Embeddedness	17
Velocity/Depth Regimes	20
Frequency of Riffles	20
Total Habitat Score	226

MCMICR33	
Habitat Summary	
Instream Cover	11
Substrate for Macroinvertebrates	14
Channel Alteration	20
Sediment Deposition	18
Channel Flow Status	19
Condition of Banks	19
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	13
Riparian Vegetative Zone Width	6
Embeddedness	16
Velocity/Depth Regimes	17
Frequency of Riffles	16
Total Habitat Score	189

POCOCR14	
Habitat Summary	
Instream Cover	16
Substrate for Macroinvertebrates	20
Channel Alteration	19
Sediment Deposition	14
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	11
Embeddedness	17
Velocity/Depth Regimes	15
Frequency of Riffles	20
Total Habitat Score	205

MCMICR20	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	10
Channel Alteration	0
Sediment Deposition	15
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	16
Riparian Vegetative Zone Width	5
Embeddedness	16
Velocity/Depth Regimes	12
Frequency of Riffles	6
Total Habitat Score	151

BRODCR01	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	18
Channel Alteration	15
Sediment Deposition	18
Channel Flow Status	20
Condition of Banks	15
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	10
Embeddedness	18
Velocity/Depth Regimes	17
Frequency of Riffles	17
Total Habitat Score	202

PARACR08	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	19
Channel Alteration	18
Sediment Deposition	13
Channel Flow Status	18
Condition of Banks	15
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	20
Embeddedness	18
Velocity/Depth Regimes	18
Frequency of Riffles	16
Total Habitat Score	211

DEHOCR04	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	19
Channel Alteration	15
Sediment Deposition	18
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	16
Riparian Vegetative Zone Width	4
Embeddedness	18
Velocity/Depth Regimes	16
Frequency of Riffles	19
Total Habitat Score	195

DEHOCR05	
Habitat Summary	
Instream Cover	20
Substrate for Macroinvertebrates	19
Channel Alteration	12
Sediment Deposition	18
Channel Flow Status	15
Condition of Banks	15
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	15
Embeddedness	18
Velocity/Depth Regimes	15
Frequency of Riffles	19
Total Habitat Score	202

TANKCR02	
Habitat Summary	
Instream Cover	10
Substrate for Macroinvertebrates	12
Channel Alteration	20
Sediment Deposition	16
Channel Flow Status	19
Condition of Banks	16
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	20
Embeddedness	15
Velocity/Depth Regimes	10
Frequency of Riffles	15
Total Habitat Score	193

HAWKRU01	
Habitat Summary	
Instream Cover	12
Substrate for Macroinvertebrates	15
Channel Alteration	12
Sediment Deposition	17
Channel Flow Status	19
Condition of Banks	16
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	17
Riparian Vegetative Zone Width	4
Embeddedness	15
Velocity/Depth Regimes	17
Frequency of Riffles	13
Total Habitat Score	177

AQUACR11	
Habitat Summary	
Substrate for Macroinvertebrates	14
Pool Variability	11
Channel Alteration	13
Sediment Deposition	12
Channel Flow Status	19
Condition of Banks	18
Bank Vegetative Protection	20
Riparian Vegetative Zone Width	15
Pool Substrate Characterization	15
Total Habitat Score	137

AQUACR12	
Habitat Summary	
Instream Cover	13
Substrate for Macroinvertebrates	18
Channel Alteration	20
Sediment Deposition	17
Channel Flow Status	20
Condition of Banks	16
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	15
Riparian Vegetative Zone Width	14
Embeddedness	15
Velocity/Depth Regimes	17
Frequency of Riffles	17
Total Habitat Score	202

BUCKCR07	
Habitat Summary	
Instream Cover	16
Substrate for Macroinvertebrates	15
Channel Alteration	20
Sediment Deposition	15
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	14
Riparian Vegetative Zone Width	4
Embeddedness	14
Velocity/Depth Regimes	16
Frequency of Riffles	12
Total Habitat Score	179

BUCKCR06	
Habitat Summary	
Substrate for Macroinvertebrates	18
Pool Variability	15
Channel Alteration	18
Sediment Deposition	16
Channel Flow Status	17
Condition of Banks	18
Bank Vegetative Protection	18
Riparian Vegetative Zone Width	6
Pool Substrate Characterization	18
Total Habitat Score	144

BUCKCR01	
Habitat Summary	
Instream Cover	15
Substrate for Macroinvertebrates	15
Channel Alteration	19
Sediment Deposition	14
Channel Flow Status	16
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	12
Riparian Vegetative Zone Width	5
Embeddedness	16
Velocity/Depth Regimes	20
Frequency of Riffles	13
Total Habitat Score	179

BUCKCR05	
Habitat Summary	
Substrate for Macroinvertebrates	16
Pool Variability	15
Channel Alteration	19
Sediment Deposition	13
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	17
Riparian Vegetative Zone Width	2
Pool Substrate Characterization	15
Total Habitat Score	131

POCOCR20	
Habitat Summary	
Instream Cover	20
Substrate for Macroinvertebrates	20
Channel Alteration	20
Sediment Deposition	18
Channel Flow Status	18
Condition of Banks	16
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	20
Embeddedness	19
Velocity/Depth Regimes	20
Frequency of Riffles	20
Total Habitat Score	230

POCOCR16	
Habitat Summary	
Instream Cover	15
Substrate for Macroinvertebrates	19
Channel Alteration	9
Sediment Deposition	17
Channel Flow Status	18
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	15
Riparian Vegetative Zone Width	3
Embeddedness	17
Velocity/Depth Regimes	18
Frequency of Riffles	20
Total Habitat Score	185

POCOCR17	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	20
Channel Alteration	10
Sediment Deposition	19
Channel Flow Status	20
Condition of Banks	12
Bank Vegetative Protection	17
Grazing or Other Disruptive Pressure	4
Riparian Vegetative Zone Width	4
Embeddedness	17
Velocity/Depth Regimes	19
Frequency of Riffles	20
Total Habitat Score	180

SCOTCR04	
Habitat Summary	
Instream Cover	10
Substrate for Macroinvertebrates	10
Channel Alteration	15
Sediment Deposition	16
Channel Flow Status	20
Condition of Banks	15
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	17
Riparian Vegetative Zone Width	8
Embeddedness	10
Velocity/Depth Regimes	14
Frequency of Riffles	13
Total Habitat Score	168

CRCRPO04	
Habitat Summary	
Instream Cover	17
Substrate for Macroinvertebrates	15
Channel Alteration	19
Sediment Deposition	19
Channel Flow Status	20
Condition of Banks	19
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	16
Embeddedness	15
Velocity/Depth Regimes	16
Frequency of Riffles	15
Total Habitat Score	210

POCOCR18	
Habitat Summary	
Instream Cover	17
Substrate for Macroinvertebrates	19
Channel Alteration	15
Sediment Deposition	16
Channel Flow Status	19
Condition of Banks	16
Bank Vegetative Protection	16
Grazing or Other Disruptive Pressure	15
Riparian Vegetative Zone Width	4
Embeddedness	16
Velocity/Depth Regimes	20
Frequency of Riffles	17
Total Habitat Score	190

BUSHCR10	
Habitat Summary	
Instream Cover	20
Substrate for Macroinvertebrates	20
Channel Alteration	20
Sediment Deposition	20
Channel Flow Status	20
Condition of Banks	18
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	19
Riparian Vegetative Zone Width	15
Embeddedness	16
Velocity/Depth Regimes	20
Frequency of Riffles	20
Total Habitat Score	228

BUSHCR09	
Habitat Summary	
Instream Cover	19
Substrate for Macroinvertebrates	20
Channel Alteration	19
Sediment Deposition	15
Channel Flow Status	20
Condition of Banks	13
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	10
Embeddedness	16
Velocity/Depth Regimes	19
Frequency of Riffles	18
Total Habitat Score	208

MARSCR08	
Habitat Summary	
Instream Cover	14
Substrate for Macroinvertebrates	14
Channel Alteration	14
Sediment Deposition	15
Channel Flow Status	20
Condition of Banks	15
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	15
Riparian Vegetative Zone Width	6
Embeddedness	13
Velocity/Depth Regimes	15
Frequency of Riffles	12
Total Habitat Score	173

MARSCR09	
Habitat Summary	
Instream Cover	13
Substrate for Macroinvertebrates	12
Channel Alteration	14
Sediment Deposition	18
Channel Flow Status	19
Condition of Banks	16
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	3
Riparian Vegetative Zone Width	7
Embeddedness	14
Velocity/Depth Regimes	15
Frequency of Riffles	12
Total Habitat Score	163

CHERC14	
Habitat Summary	
Instream Cover	16
Substrate for Macroinvertebrates	11
Channel Alteration	19
Sediment Deposition	16
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	19
Embeddedness	14
Velocity/Depth Regimes	14
Frequency of Riffles	10
Total Habitat Score	190

CHERC11	
Habitat Summary	
Instream Cover	15
Substrate for Macroinvertebrates	17
Channel Alteration	14
Sediment Deposition	14
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	15
Embeddedness	9
Velocity/Depth Regimes	18
Frequency of Riffles	17
Total Habitat Score	192

LEHIRI01	
Habitat Summary	
Instream Cover	20
Substrate for Macroinvertebrates	19
Channel Alteration	20
Sediment Deposition	19
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	4
Riparian Vegetative Zone Width	5
Embeddedness	18
Velocity/Depth Regimes	18
Frequency of Riffles	20
Total Habitat Score	197

LEHIRI02	
Habitat Summary	
Instream Cover	19
Substrate for Macroinvertebrates	15
Channel Alteration	15
Sediment Deposition	17
Channel Flow Status	19
Condition of Banks	15
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	7
Riparian Vegetative Zone Width	9
Embeddedness	17
Velocity/Depth Regimes	18
Frequency of Riffles	13
Total Habitat Score	184

TOBYCR14	
Habitat Summary	
Instream Cover	17
Substrate for Macroinvertebrates	16
Channel Alteration	14
Sediment Deposition	17
Channel Flow Status	18
Condition of Banks	16
Bank Vegetative Protection	18
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	7
Embeddedness	18
Velocity/Depth Regimes	16
Frequency of Riffles	14
Total Habitat Score	189

TUNKCR03	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	19
Channel Alteration	20
Sediment Deposition	19
Channel Flow Status	19
Condition of Banks	16
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	20
Riparian Vegetative Zone Width	19
Embeddedness	17
Velocity/Depth Regimes	20
Frequency of Riffles	20
Total Habitat Score	227

TUNKCR07	
Habitat Summary	
Substrate for Macroinvertebrates	16
Pool Variability	11
Channel Alteration	11
Sediment Deposition	12
Channel Flow Status	20
Condition of Banks	15
Bank Vegetative Protection	20
Riparian Vegetative Zone Width	5
Pool Substrate Characterization	18
Total Habitat Score	128

DOTTCR04	
Habitat Summary	
Instream Cover	14
Substrate for Macroinvertebrates	16
Channel Alteration	3
Sediment Deposition	16
Channel Flow Status	18
Condition of Banks	12
Bank Vegetative Protection	14
Grazing or Other Disruptive Pressure	15
Riparian Vegetative Zone Width	5
Embeddedness	15
Velocity/Depth Regimes	18
Frequency of Riffles	17
Total Habitat Score	163

RED_RU03	
Habitat Summary	
Substrate for Macroinvertebrates	17
Pool Variability	9
Channel Alteration	20
Sediment Deposition	8
Channel Flow Status	18
Condition of Banks	18
Bank Vegetative Protection	20
Riparian Vegetative Zone Width	20
Pool Substrate Characterization	15
Total Habitat Score	145

CLEARU02	
Habitat Summary	
Instream Cover	16
Substrate for Macroinvertebrates	8
Channel Alteration	15
Sediment Deposition	15
Channel Flow Status	17
Condition of Banks	18
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	11
Riparian Vegetative Zone Width	5
Embeddedness	9
Velocity/Depth Regimes	5
Frequency of Riffles	4
Total Habitat Score	142

DUPURU01	
Habitat Summary	
Instream Cover	17
Substrate for Macroinvertebrates	6
Channel Alteration	16
Sediment Deposition	16
Channel Flow Status	4
Condition of Banks	20
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	17
Embeddedness	12
Velocity/Depth Regimes	5
Frequency of Riffles	4
Total Habitat Score	154

TOBYCR01	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	19
Channel Alteration	14
Sediment Deposition	16
Channel Flow Status	19
Condition of Banks	17
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	12
Riparian Vegetative Zone Width	7
Embeddedness	15
Velocity/Depth Regimes	19
Frequency of Riffles	17
Total Habitat Score	192

TOBYCR20	
Habitat Summary	
Instream Cover	15
Substrate for Macroinvertebrates	14
Channel Alteration	15
Sediment Deposition	16
Channel Flow Status	19
Condition of Banks	17
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	17
Riparian Vegetative Zone Width	17
Embeddedness	16
Velocity/Depth Regimes	19
Frequency of Riffles	16
Total Habitat Score	200

TOBYCR19	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	17
Channel Alteration	20
Sediment Deposition	18
Channel Flow Status	18
Condition of Banks	18
Bank Vegetative Protection	20
Grazing or Other Disruptive Pressure	18
Riparian Vegetative Zone Width	20
Embeddedness	18
Velocity/Depth Regimes	15
Frequency of Riffles	15
Total Habitat Score	215

MARSCR10	
Habitat Summary	
Instream Cover	20
Substrate for Macroinvertebrates	20
Channel Alteration	17
Sediment Deposition	19
Channel Flow Status	19
Condition of Banks	19
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	16
Riparian Vegetative Zone Width	14
Embeddedness	18
Velocity/Depth Regimes	17
Frequency of Riffles	20
Total Habitat Score	218

MARSCR12	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	19
Channel Alteration	15
Sediment Deposition	15
Channel Flow Status	18
Condition of Banks	15
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	5
Riparian Vegetative Zone Width	5
Embeddedness	16
Velocity/Depth Regimes	16
Frequency of Riffles	17
Total Habitat Score	178

MARSCR13	
Habitat Summary	
Instream Cover	13
Substrate for Macroinvertebrates	18
Channel Alteration	13
Sediment Deposition	17
Channel Flow Status	19
Condition of Banks	16
Bank Vegetative Protection	19
Grazing or Other Disruptive Pressure	15
Riparian Vegetative Zone Width	4
Embeddedness	11
Velocity/Depth Regimes	16
Frequency of Riffles	17
Total Habitat Score	178

MARSCR11	
Habitat Summary	
Instream Cover	18
Substrate for Macroinvertebrates	15
Channel Alteration	15
Sediment Deposition	16
Channel Flow Status	20
Condition of Banks	18
Bank Vegetative Protection	14
Grazing or Other Disruptive Pressure	3
Riparian Vegetative Zone Width	4
Embeddedness	16
Velocity/Depth Regimes	15
Frequency of Riffles	17
Total Habitat Score	171