## Bioindicators of Strawberry Creek Worksheet

## NORTH FORK DATA

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| Vial # | Taxon | Count |
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| Total: | |  |

## North Fork Strawberry Creek Data Summary Sheet

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | C | D | E | F | G |
|  | Taxon Name | Functional Feeding Group | *x*i | *p*i | *t*i | *= p*i\* ti | ln *p*i | *= p*i *\** ln *p*i |
| 1 |  |  |  |  |  |  |  |  |
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| 12 |  |  |  |  |  |  |  |  |
|  |  | Total (n) = |  |  | Total = |  | Total = |  |

**Metric Scores**

1. **Taxon Richness (R) =** Total number of taxa present = \_\_\_\_\_\_
2. **% EPT =** Total number of individuals in EPT divided by n (total of column C) = \_\_\_\_\_\_
3. **% Filterers =** Total number of filterers divided by n (total of column C) = \_\_\_\_\_\_
4. **% Predators =** Total number of predators divided by n (total of column C) = \_\_\_\_\_\_
5. **Family Biotic Index (FBI) =** Sum of *p*i\* ti = Total of column E = \_\_\_\_\_
6. **Shannon Diversity Index (*H’*)** = - Sum of *p*i *\** ln *p*i = - Total of column G = \_\_\_\_

## SOUTH FORK DATA

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| Vial # | Taxon | Count |
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| Total: | |  |

## South Fork Strawberry Creek Data Summary Sheet

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A | B | C | C | D | E | F | G |
|  | Taxon Name | Functional Feeding Group | *x*i | *p*i | *t*i | *= p*i\* ti | ln *p*i | *= p*i *\** ln *p*i |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
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| 12 |  |  |  |  |  |  |  |  |
|  |  | Total (n) = |  |  | Total = |  | Total = |  |

**Metric Scores**

1. **Taxon Richness (R) =** Total number of taxa present = \_\_\_\_\_\_
2. **% EPT =** Total number of individuals in EPT divided by n (total of column C) = \_\_\_\_\_\_
3. **% Filterers =** Total number of filterers divided by n (total of column C) = \_\_\_\_\_\_
4. **% Predators =** Total number of predators divided by n (total of column C) = \_\_\_\_\_\_
5. **Family Biotic Index (FBI) =** Sum of *p*i\* ti = Total of column E = \_\_\_\_\_
6. **Shannon Diversity Index (*H’*)** = - Sum of *p*i *\** ln *p*i = - Total of column G = \_\_\_\_

**To begin, state your hypothesis regarding the relative water quality between the North and South forks. Briefly explain your reasoning.** Initial hypothesis:

**Your assignment for this lab is to gather your data, combine it with the data gathered by the rest of the class and use the combined data to complete a lab report.** Follow the guidelines in the “LabReport\_Guide” available on bCourses in the Files/Lab Materials/Ecology Labs folder.

Begin your *Results* section with your observations of the graphed data from your Jupyter Notebook. and address the first three questions below. This will familiarize you with the data.

Then, use the Jupyter Notebook to perform a resampling test for each metric to compare each measure between Forks. Each group member should complete at least one of the tests. Be sure to indicate which group member performed each test. To complete your results section, follow the instructions in the Results section of the guidelines above for how to write lab reports. Your results must include your answers to the four questions below. \*

1. Using visual inspection of the graphed data, identify the metrics for which the North Fork appears to have better water quality than the South Fork. For which measures does the South Fork appear to have better water quality than the North Fork?
2. For which metrics is there overlap between the measurements of the North Fork and the South Fork?
3. How does the value your group calculated for each metric compare to the mean for each metric calculated by the class? How do you explain any differences?
4. According to the statistical results, which metrics were significantly different between the North Fork and South Fork?

**In your *conclusions,* you must address each of the following questions.\***

1. Do your results support your group’s hypothesis about the relative water quality of the two forks? Explain.
2. Based on your results which fork has lower water quality? Be sure to discuss your results for each measure and any relevant observations you made.
3. Why might it be beneficial to use several metrics in a biomonitoring program? Use examples from this lab to compare the specific kinds of information that different metrics provide.
4. Is it possible that the observed differences between the North and South Forks are due to differences in the habitats at each sampling location? Design a new field study to assess whether differences between the two sites are due to water quality conditions (e.g., pollutants) or habitat differences. If you could sample from additional sites, how would you try to assess differences in benthic macroinvertebrate communities?
5. The samples in this lab were collected in April. How do you think the invertebrate community would change if you sampled at different times of year?

**\* Address each of the questions listed here in the text of your results and conclusions sections. These questions are to guide your content; do not include these points as a numbered**

**or bulleted list.**