FISH WINTER DIETS

ICHTHYOLOGY LABORATORY

Location: Pasteur Hall Room 225

Objective: Learn how to assess winter diets of local fishes.

Hypothesis: Local invertivorous stream fishes will have similar diets during the winter.

Agenda:

1) Collect a variety of fishes from local coldwater streams during early March, over-anesthetize them, and preserve them for use in the lab.

2) Weigh (g, wet weight) and measure (total length, mm) a fish of your choice. Dissect out the stomach, slit it open, and rinse its contents onto a watch glass or plastic weighing dish. Use a dissecting microscope to count and identify the various invertebrate prey items.

3) Record fish measurements and the types and numbers of prey on the data sheet provided.

4) Place all prey items from your fish into a pre-weighed plastic weighing dish, air-dry in the fume hood at room temperature for 48 hours, and re-weigh to determine the total dry weight of all prey within the fish's stomach. Record this value on the data sheet.

5) Repeat steps 2-4 for as many additional fish as possible.

Analysis:

1) Using data from **ALL** fish examined by the class, create a

summary graph (bar chart) for all prey in the diets of *two* species of fish (e.g., brown trout and slimy sculpin). This graph (or figure) should present prey types on the X axis, frequency (or abundance or number) on the Y axis, and have separate colored bars for each species of fish. Label this as **Figure 1**, and include a descriptive heading identifying the contents of the figure, the species of fishes (including scientific names), the total numbers of fish examined of each species (sample sizes), and location and date of fish collection.

2) Using data from **ALL** fish, compare the combined diets of all fish of one species to the combined diets of all fish of another species from the same stream. Use the Bray-Curtis similarity index in this comparison. A B-C index value > 0.6 indicates that the two diets being compared are similar (not significantly different), whereas a value <0.6 indicates that the two diets being compared are significantly different.

3) Conduct two t-tests (both two-sample, non-paired, two-tailed) using data from **ALL** fish of two species: 1) compare the numbers of prey consumed by individual fish between the two species, and 2) compare the standardized dry weights of prey (mg dry weight of prey/g fish wet weight) found in individual fish between the two species. Record both the t values and the P values. A P value < 0.05 indicates that the mean values of the two sets of data being compared differ significantly from one another.

4) Write a narrative detailing your findings for this lab (this should probably be at least two paragraphs in length). Use the figure and the 3 statistical tests as points of reference, and call the reader's attention to the main findings of the lab exercise summarized in the figure and supported by the statistical tests. Point out the patterns and trends in the data presented in the figure, and explain what the statistical tests indicate about the diets of the two species of fish being compared. For example, how many different types of prey

were consumed? Did both species have similarly diverse (or narrow) diets? Did one species tend to eat more individual organisms than the other species?

Equipment:
Metric rulers, metric balances, dissecting microscopes, light sources, dissecting tools, wash bottles, watch glasses, weighing dishes, data sheets