Reviewing a lab report

Read each of the following excerpts based on a report titled *Stream Amphibians as Indicators of Ecosystem Stress: A Case Study from California's Redwoods*. Rank each example from worst to best (within each category) and correct all of the mistakes that you see.

Final paragraph of the introduction

Example 1

Here we provide an analysis of the effects of sediment erosion from road construction on densities of the three most abundant native, stream-dwelling amphibians in five streams. Our approach was to examine and compare these densities with those of the same species in five unimpacted (control) streams in the same basin. We hypothesize that amphibian density will be higher in the umimpacted streams than in the impacted streams.

Example 2

Sedimentation of aquatic ecosystems is a common outcome of many land management activities, including timber harvesting, road building, mining, and grazing (Meehan 1991, Reid 1993, Waters 1995). Amphibians are thought to be sensitive to perturbations in both terrestrial and aquatic environments because of their dual life histories, highly specialized physiological adaptations, and specific microhabitat requirements. We believe that amphibian density will be higher in the umimpacted streams than in the impacted streams.

Example 3

Road construction can negatively affect amphibians because of sedimentation. In this experiment we will show that amphibian density is strongly affected by road construction.

Methods – Study species

Example 1

The Coastal Giant Salamander, *Dicamptodon tenebrosus*, is endemic to the western parts of North America. It is found in freshwater habitats such as rivers, lakes and marshes. The adult Coastal Giant Salamander can grow to be up to 34 cm (13 inches) long, hence the name Giant Salamander. This salamander has four toes on the front feet and five toes on the back feet. The tail makes up almost ½ of the body length of the salamander. The head, back, and sides have a pattern of dark blotches on a light brown background. The head is broad with a shovel-like snout and a fold of skin across the throat called the gular fold. The eyes are medium in size and with a large black pupil. This species is one of the few salamanders capable of vocalizing (Wikipedia). Like most salamanders, this species has aquatic larvae that transform into terrestrial adults after 2-3 years. This salamander will eat almost anything; it is like the goat of the salamander world.

Example 2

The Coastal Giant Salamander, *Dicamptodon tenebrosus*, is the largest terrestrial salamander in North America. It eats aquatic invertebrates and small.

Example 3

The Coastal Giant Salamander, *Dicamptodon tenebrosus*, is the largest terrestrial salamander in North America. It is found in freshwater habitats in western parts of North America (Cockran *et al*., 1996). Its diet includes aquatic invertebrates and small vertebrates such as lizards, salamanders and fish. On average, the larvae spend 2-3 years in cold lakes, ponds or streams before transforming into terrestrial adults (Nusbaum et al., 1983).

Methods – Experimental Design

Example 1

Within each stream, one or more amphibian sampling units (cross stream belt transects) was placed in the stream in each mesohabitat type (example: pool, run, riffle) based on habitat length, placing one belt transect for every 10 m of habitat. Belt transects (hereafter belts) were 0.6 m wide and extended from bank to bank so that sampling unit length varied with stream width. Each belt was then thoroughly searched for amphibians. The area was first scanned for visible animals and then all cover objects were removed working from bank to bank and upstream until the entire area was searched. Animals were captured using a metal mesh net, identified, sexed (if possible), measured (snout–vent and total length), and released after sampling was completed.

Example 2

At each stream amphibians were collected, identified and measured. The amphibians were released after sampling was completed. We searched in pools, runs and riffles in each stream.

Example 3

Within each stream, one or more amphibian sampling units (cross stream belt transects) was placed in the stream in each mesohabitat type (example: pool, run, riffle) based on habitat length, placing one belt transect for every 10 m of habitat. Belt transects (hereafter belts) were 0.6 m wide and extended from bank to bank so that sampling unit length varied with stream width. Each belt was then thoroughly searched for amphibians. We would very slowly and carefully scan the belts for visible animals. Then we would scan the surrounding area. Next all cover objects, such as rocks, large woody debris, and leaf mats, were removed working from bank to bank and upstream until the entire area was searched. Animals were captured using a metal mesh net. One person would sweep down with the net and capture the amphibian, being careful not to hurt it. Then the amphibian would be collected, identified to species, sexed (indicate if the organism was male or female), measured (snout–vent and total length in mm), and released after sampling was completed. This data was recorded in a waterproof notebook. The same person recorded the data for each trip.

Results

Example 1

Mesohabitat type and sedimentation affected amphibian density. Erosion affected Pacific giant salamander density ($F_{1,8}$ = 3.9579802394, p = 0.042453098023), and so did mesohabitat type (F_4,29 = 1.58, p > 0.05). Erosion had an effect on tailed frog density (F1,8 = 2.06, p = 0.189), but there was no effect of mesohabitat type ($F_{4,29}$ = 11.3889098302, p = 0.0001). Erosion and mesohabitat type impacted southern torrent salamander density (impact: $F_{1,8}$ = 4.93, p = 0.0372; habitat: $F_{4,29}$ = 2.67, p < 0.05).

Example 2

Mesohabitat type and sedimentation affected amphibian density. Erosion affected Pacific giant salamander density (Figure 1: $F_{1,8}$ = 3.95, p = 0.042), but there was no difference among mesohabitat types (Figure 1: $F_{4,29}$ = 1.58, p = 0.205). There was no difference in tailed frog density between the erosion and control streams (Figure 2: $F_{1,8}$ = 2.06, p = 0.189), but mesohabitat type affected tailed frog density (Figure 2: $F_{4,29}$ = 11.38, p = 0.0001). Erosion and mesohabitat type impacted southern torrent salamander density (Figure 3: impact: $F_{1,8}$ = 4.93, p = 0.0372; habitat: $F_{4,29}$ = 2.67, p = 0.050).

Example 3

Mesohabitat type and sedimentation affected amphibian density. Erosion and mesohabitat type impacted southern torrent salamander density (Figure 3: impact: $F_{1,8}$ = 4.93, p = 0.0372; habitat: $F_{4,29}$ = 2.67, p = 0.050). Erosion affected Pacific giant salamander density (Figure 2: $F_{4,29}$ = 1.58, p = 0.205), but there was no difference among mesohabitat types (Figure 1: $F_{1,8}$ = 3.95). There was no difference in tailed frog density between the erosion and control streams (Figure 2: $F_{1,8}$ = 2.06, p = 0.189), but mesohabitat type affected tailed frog density (Figure 2: p = 0.0001, $F_{4,29}$ = 11.38).

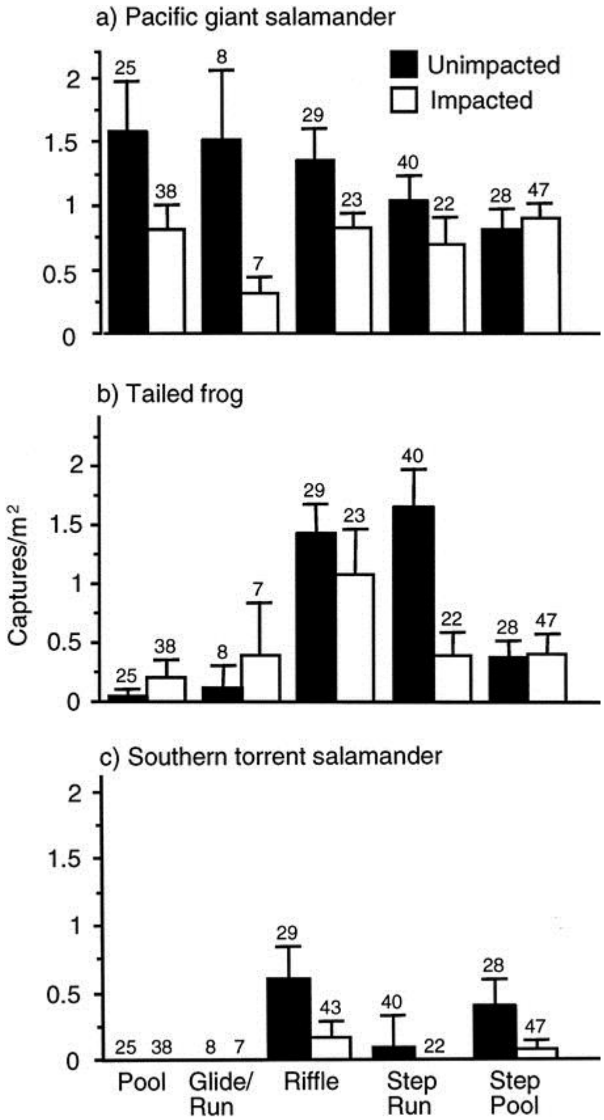

Figure captions

Example 1
Figure 4: Shows the densities of three species of amphibians a) Pacific Giant Salamander b) Tailed Frog and c) Southern torrent salamander with respect to impact and mesohabitat type. Bars represent means ($\pm$ one standard error) for the stream sets (n = 5 per stream). Numbers over bars are the number of belts sampled.

Example 2
Figure 4: Shows the densities of three species of amphibians a) Pacific Giant Salamander b) Tailed Frog and c) Southern torrent salamander.

Example 3
Figure 4: Shows the densities of three species of amphibians a) Pacific Giant Salamander b) Tailed Frog and c) Southern torrent salamander with respect to impact and mesohabitat type. Bars represent means ($\pm$ one standard error) for the stream sets (n = 5 per stream). Numbers over bars are the number of belts sampled. Pacific giant salamander density was higher in the unimpacted streams than in the impacted (erosion) streams (Figure 2a: $F_{1,8} = 3.95$, $p = 0.042$), but there was no difference among mesohabitat types (Figure 2a: $F_{4,29} = 1.58$, $p = 0.205$).