

Effectiveness of Smith-Root's Fish Handling Gloves to Immobilize Lake Trout and Rainbow Trout

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Introduction:

- Fish immobilization is a common practice in all fish hatcheries.
- Chemical agents are most commonly used to immobilize fish. However these chemical agents are often expensive and, if used incorrectly, can compromise fish health.
- Smith-Root has developed the Fish Handling Gloves™ to electrically immobilize fish; but settings that elicit the desired response in fish have not been experimentally examined.

Objectives:

- Determine if the Fish Handling Gloves are effective at immobilizing Lake Trout (*Salvelinus namaycush*) and Rainbow Trout (*Oncorhynchus mykiss*).
- Identify the most effective amperage level for immobilizing each species.
- Identify if there is a difference in the effective amperage level for immobilization between the two species.

Conclusions:

- The Fish Handling Gloves were effective at immobilizing Rainbow Trout and Lake Trout.
- The most effective amperage may differ between species – higher amperages may be needed to successfully immobilize Lake Trout
- Differences in effective amperage may be related to size, as the Lake Trout tested were larger than the Rainbow Trout.

Methods:

- All fish were raised, and all experiments were conducted at the Northern Aquaculture Demonstration Facility.
- 100 Lake Trout and 100 Rainbow Trout were sampled using the Fish Handling Gloves.
- Each fish was tested at one of five amperages (4, 6.3, 10, 16, and 25 mA).
- Length and weight were recorded while the fish was immobilized (Figure 1 & 2).
- The physical reaction of each fish to the Fish Handling Gloves was categorized into one of five reactions.
- The desired reaction was when the fish was completely immobilized, but recovered immediately upon release.
- For each species, a chi-square test was used to determine ($\alpha=0.05$) if the proportion of fish that exhibited the desired response differed by amperage.



Figure 1. Sampling fish for data collection.

Figure 2. Rainbow Trout immobilized using Smith-Root's Fish Handling Gloves.

Results:

- The amperage that most often produced the desired reaction differed between Lake Trout and Rainbow Trout ($p<0.0005$).
- The most effective amperage level for Rainbow Trout was 16 mA (desired reaction for 80% of fish); however, 16 mA was not statistically different from 6.3, 10, or 25mA (Figure 3).
- The most effective amperage level for Lake Trout was 25 mA (desired reaction for 60% of fish); however, 25 mA was not statistically different from 16 mA (Figure 3).
- All amperages produced the desired reactions for Rainbow Trout. In contrast, only 6.3 mA and greater produced the desired reactions for Lake Trout.

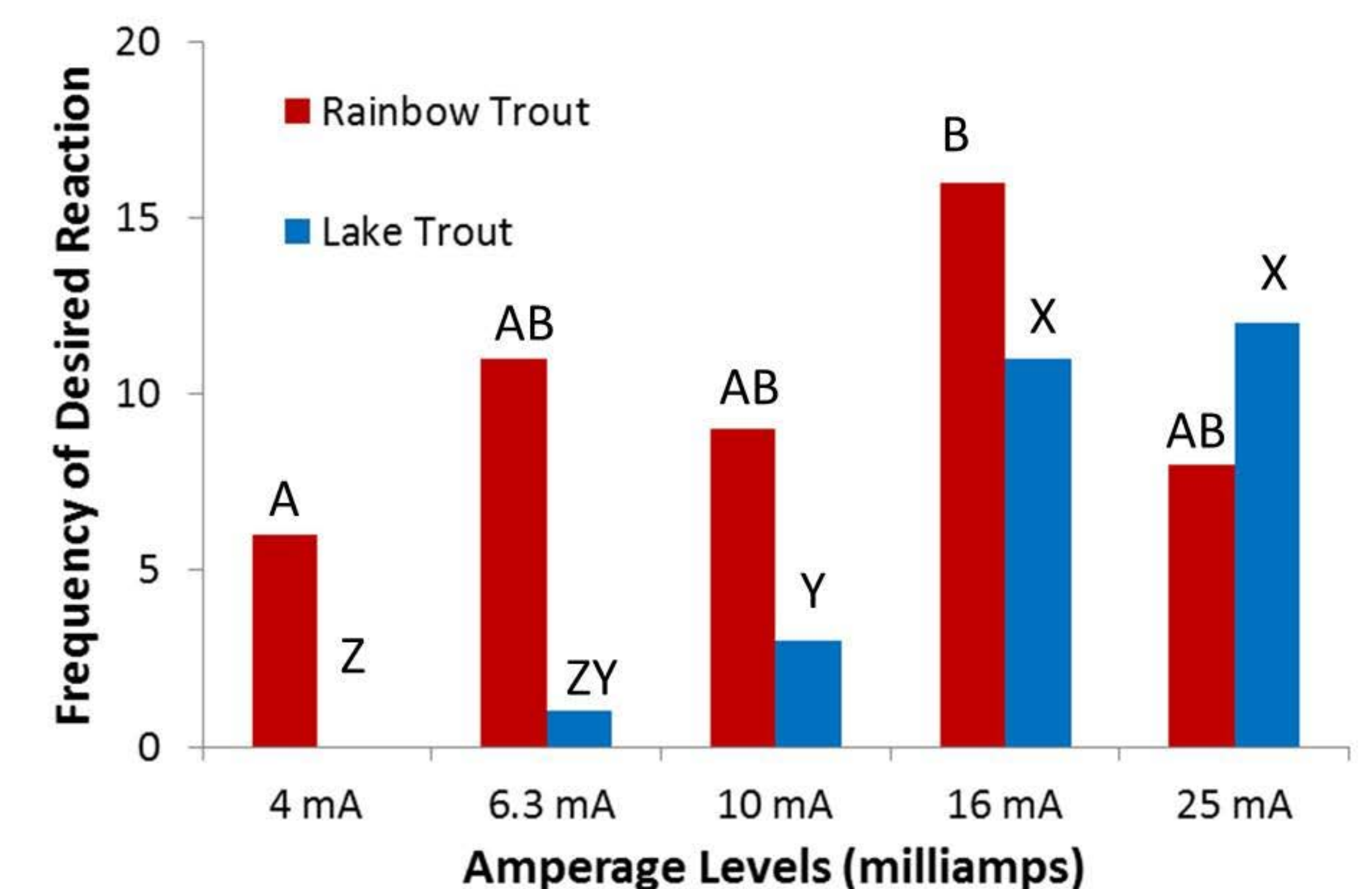


Figure 3. Frequency of 20 fish that exhibited the desired reaction for each amperage for Lake Trout and Rainbow Trout. Amperages with the same letter did not differ within the species.