

# Conservation of the least chub (*lotichthys phlegethontis*) due to negative interactions with nonnative species

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## INTRODUCTION

The least chub is a small minnow endemic to the Bonneville River Basin. It was once widely dispersed, but currently resides in only nine isolated spring pools in central and western Utah.



Figure 1. Least chub (*lotichthys phlegethontis*)

Introduction of nonnative species such as the western mosquitofish into habitats of the least chub contributed to a rapid decline in least chub populations and threatens extinction. Invasive species are often the cause of rapid decline and extinction of native species (Bailey et al., 2005).

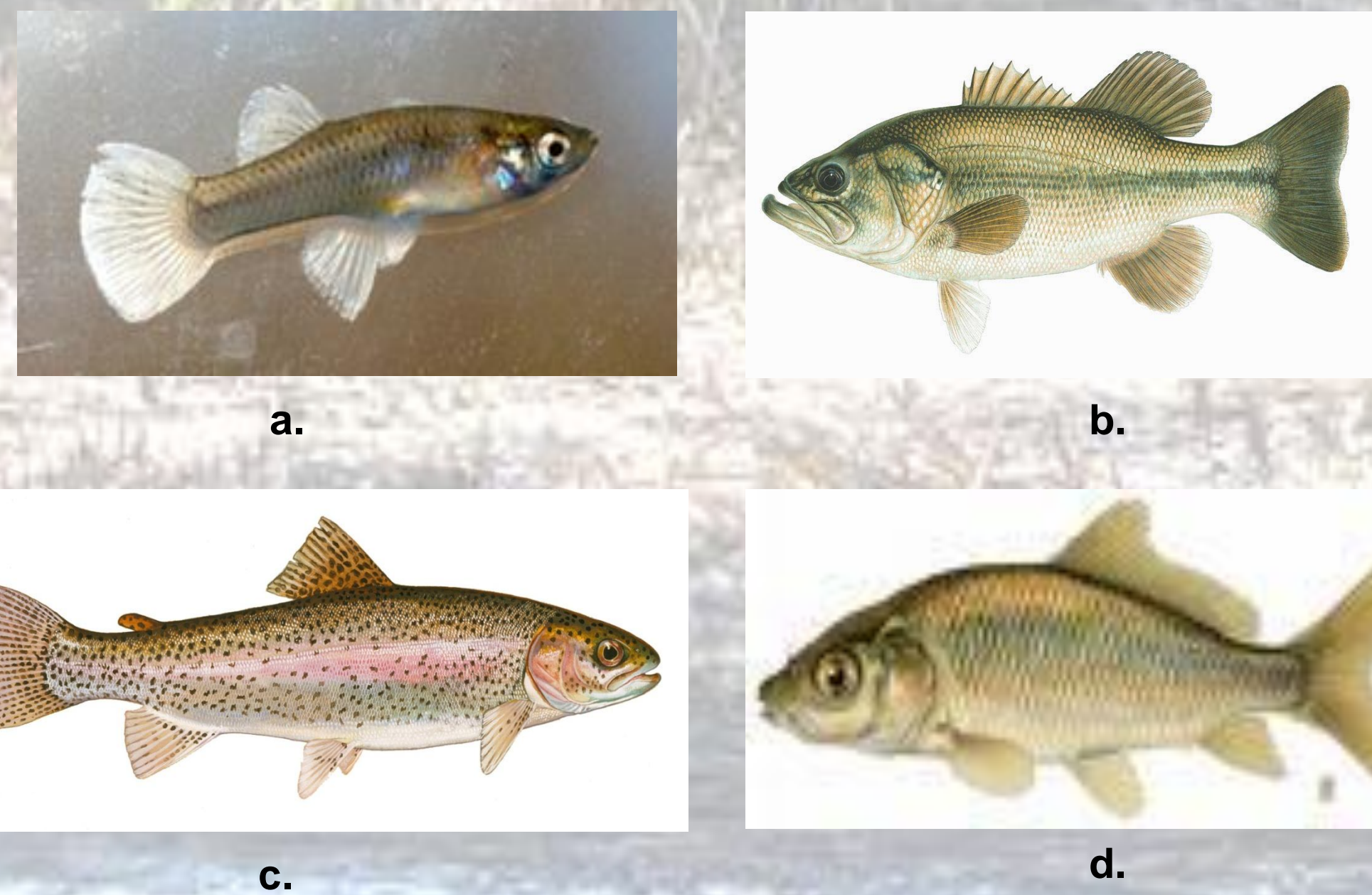


Figure 2. Nonnative species of fish that are a threat to the least chub: a) western mosquitofish (*Gambusia affinis*), b) largemouth bass (*Micropterus salmoides*), c) rainbow trout (*Oncorhynchus mykiss*), and d) common carp (*Cyprinus carpio*).

The specific cause of the least chub demise has not been determined; however, there is speculation that competition and/or predation between the least chub and nonnative species mentioned above are the main concern (Bailey et al., 2005). Western mosquitofish (for example) are very aggressive predators that feed on a variety of aquatic organisms, including their own young and the young of other fishes (Mills et al., 2004). The focus of this research is to ensure that this native species remains endemic to areas of the Bonneville River Basin by establishing a new refuge population at the Ogden Nature Center with emphasis on the control of nonnative fish.

## RESULTS

I found fathead minnow (Teal Pond), mosquitofish (Avocet and Teal Ponds), and green sunfish (Teal Pond). There weren't any fish seen at Blackbird Pond, which might indicate that it is unsuitable for fish (Figure 5). Mosquitofish are of big concern to least chub survival, so poisoning of Teal Pond and Avocet Pond would be recommended.

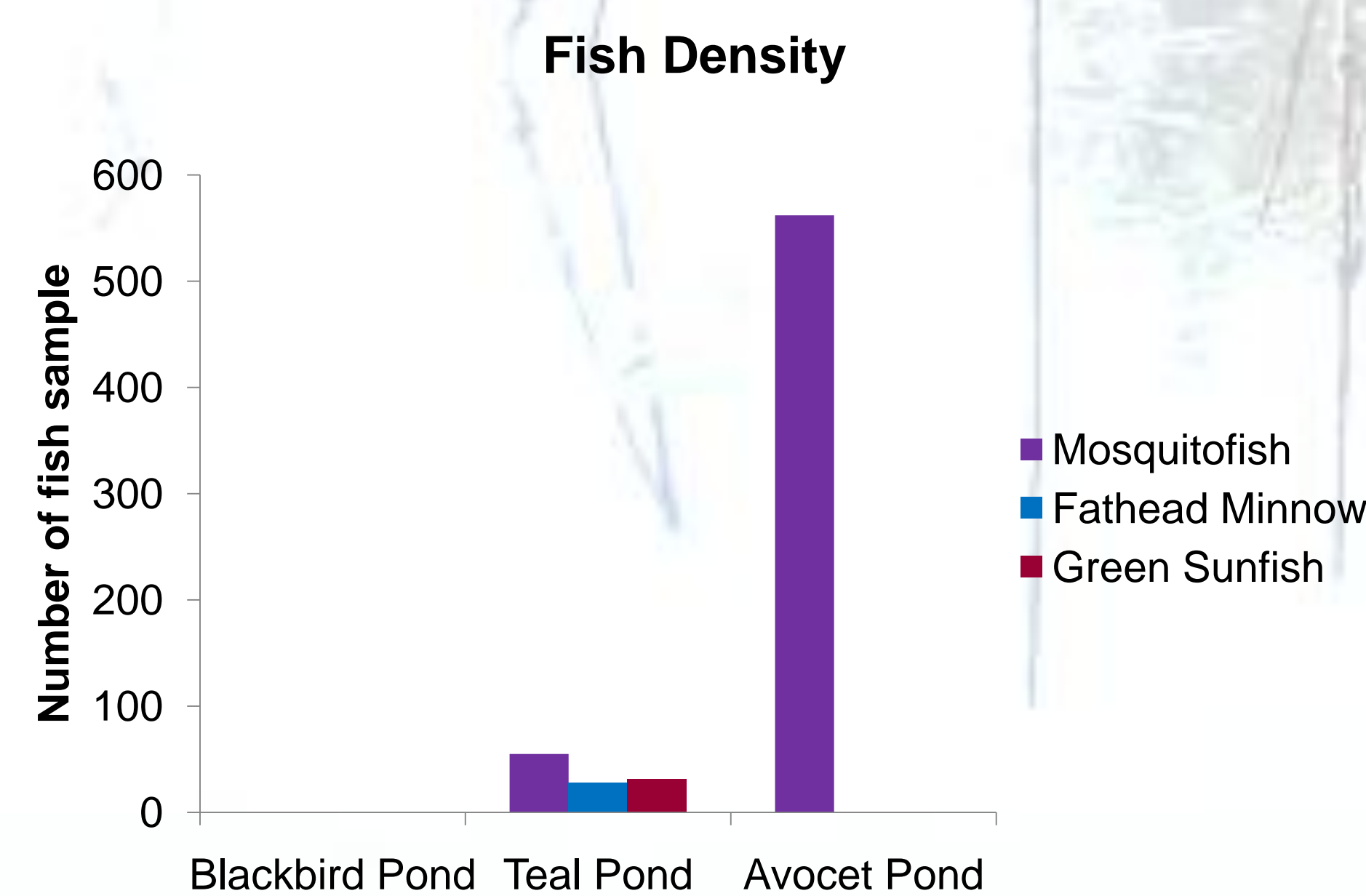


Figure 5. This graph shows the fish populations and densities at each pond throughout the course of this research.

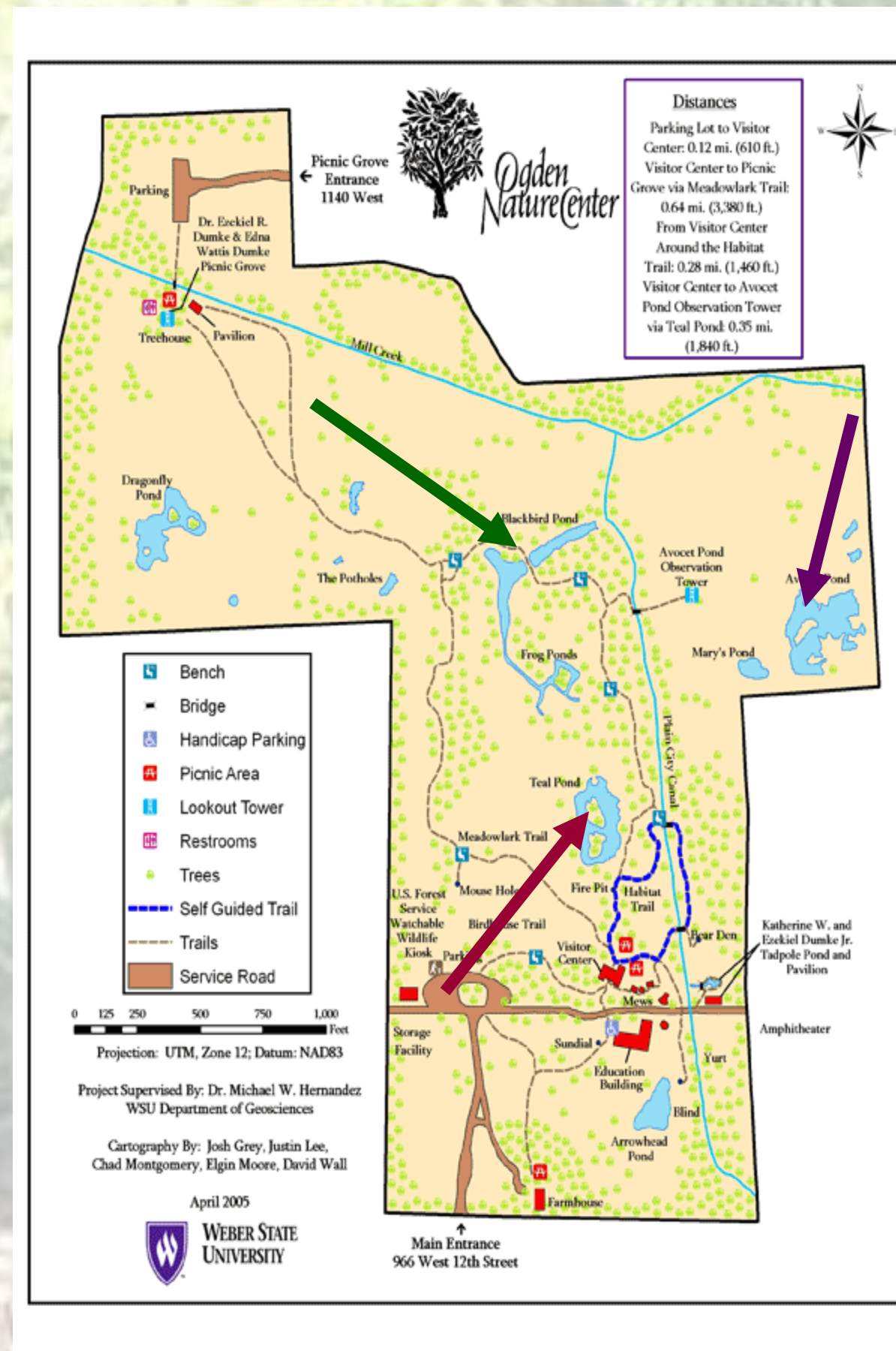


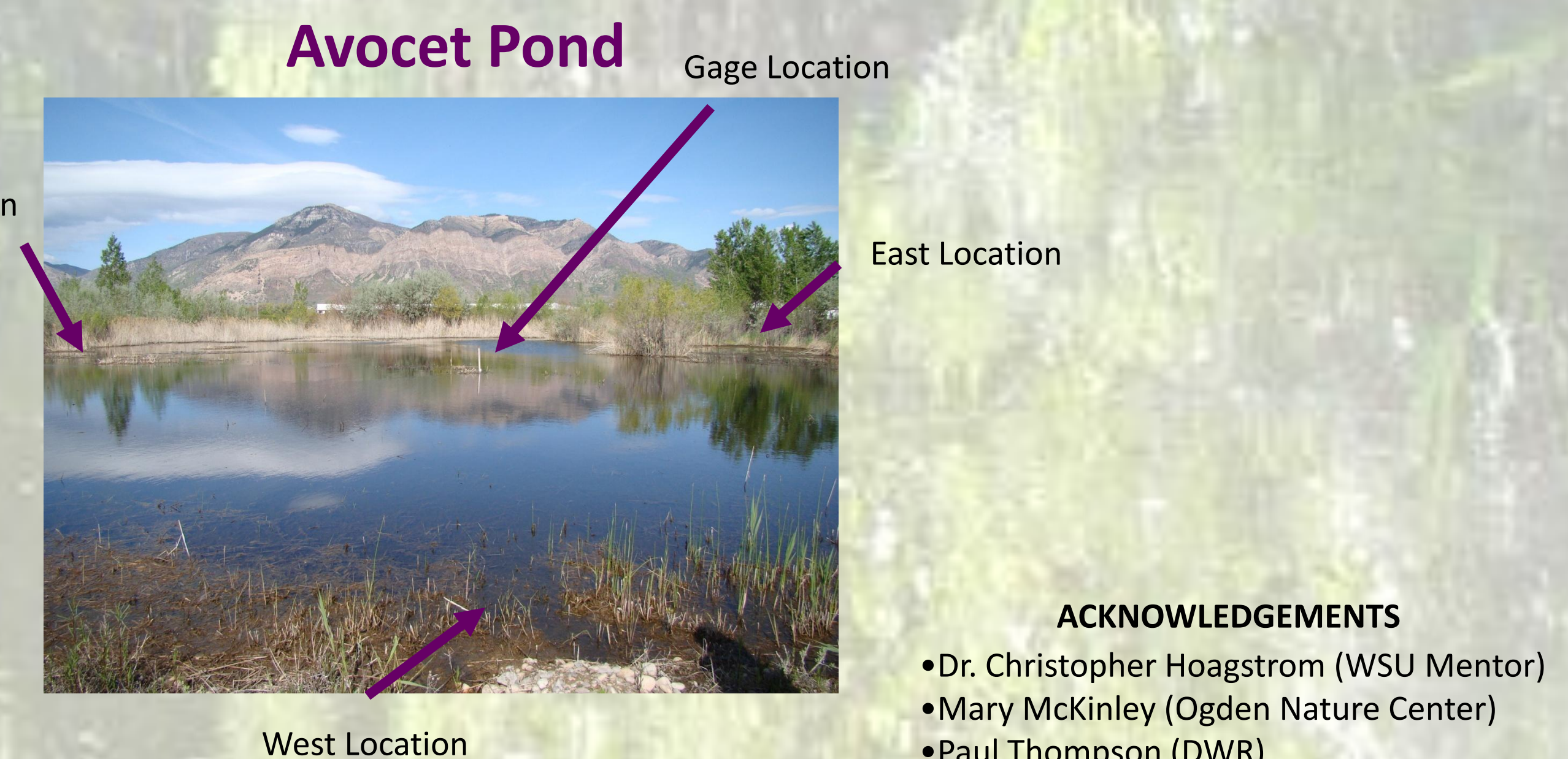
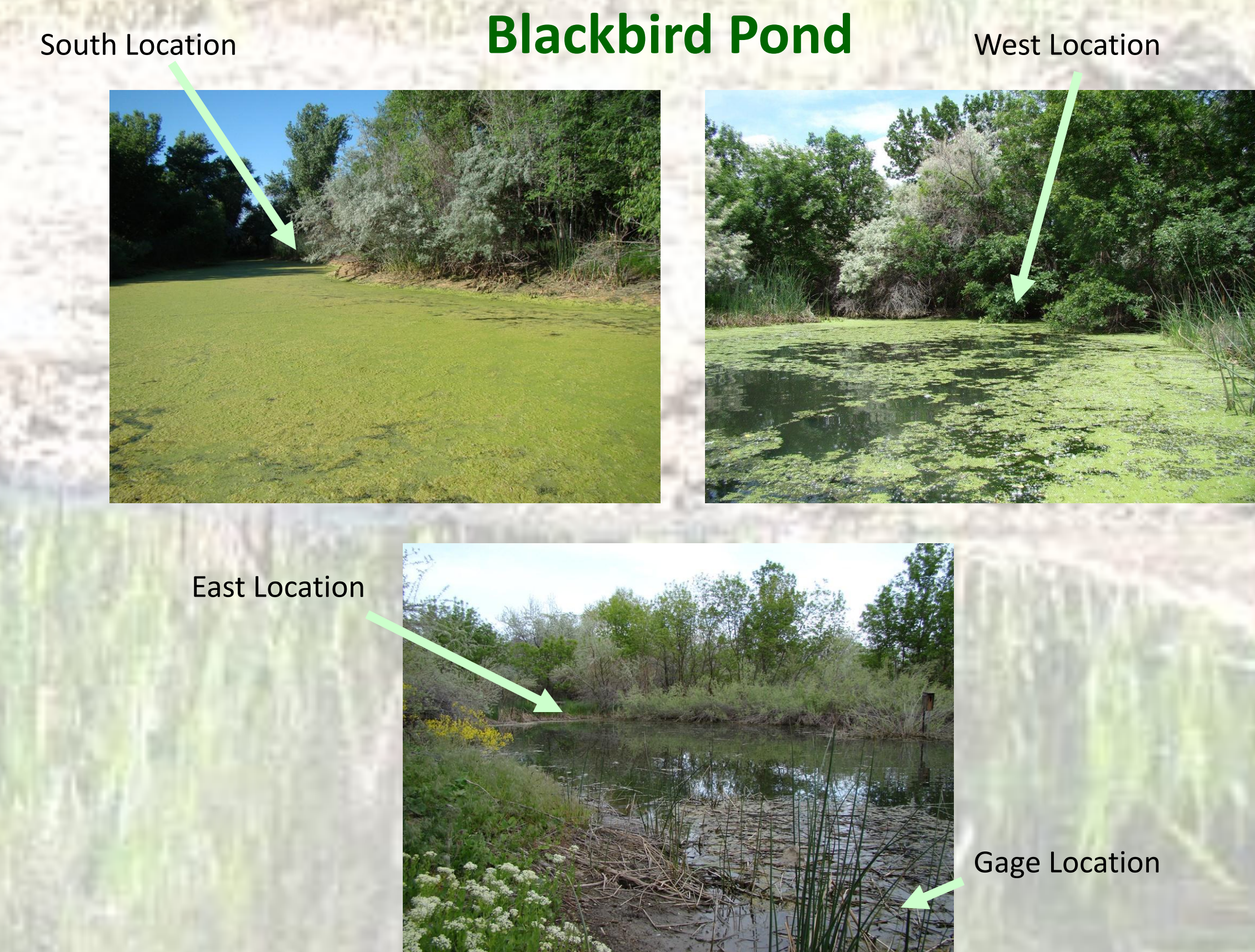
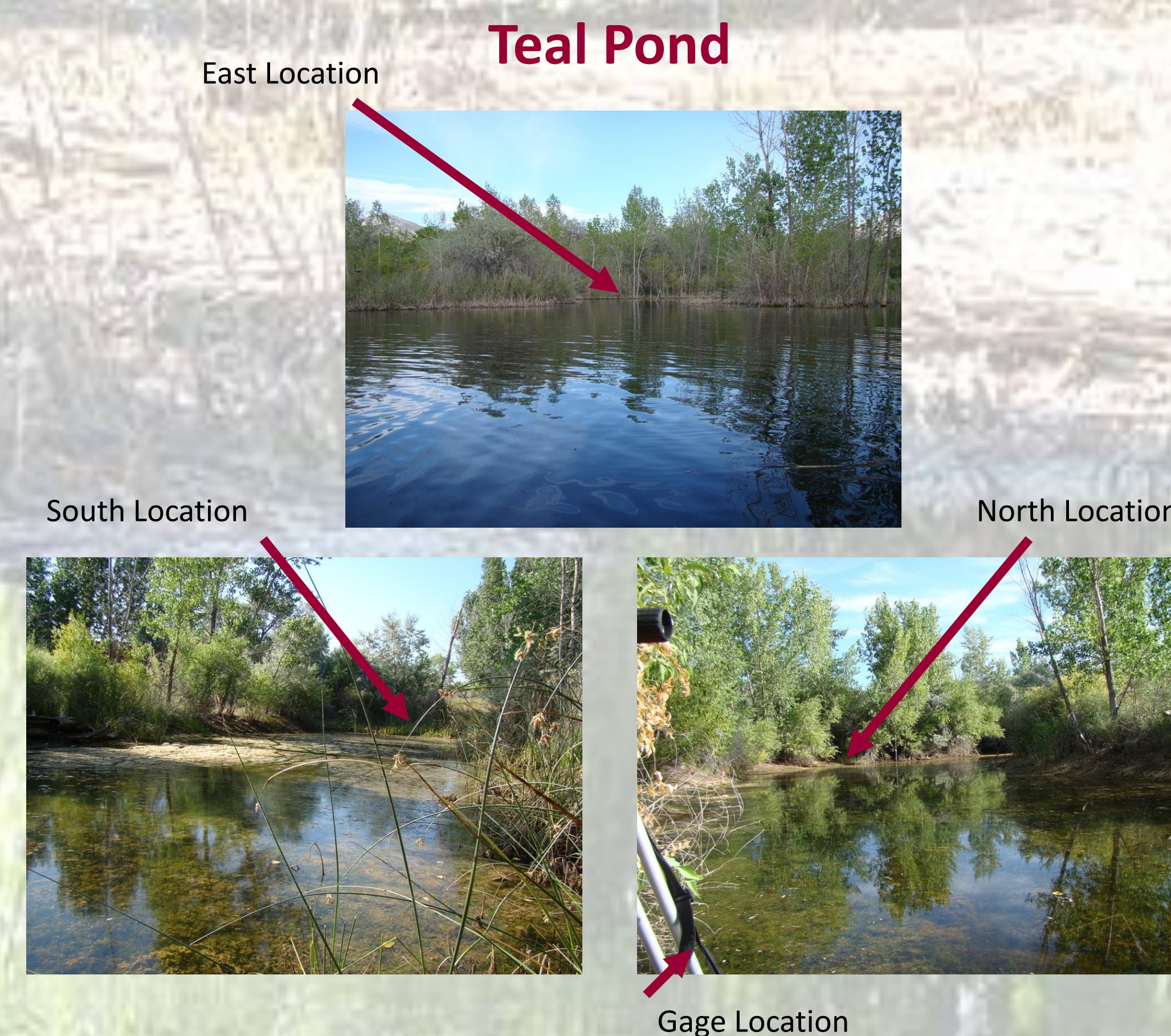
Figure 3. Location of the ponds evaluated at the Ogden Nature Center. The Plain City Canal and Millcreek canal are likely sites of unwanted reintroduction of nonnative species to Blackbird Pond, Teal Pond, and Avocet Pond.

## METHODS

I assessed the population of nonnative fish present at Avocet Pond, Blackbird Pond, and Teal Pond and evaluated potential for removal (Figure 3). Traps were placed at each pond once a month. Two traps were placed at four different locations at each pond (Figure 4) and left overnight. Fish were removed from the traps, identified, and released unharmed.



Figure 4. These pictures show how each trap was set (2 per location) at four different locations at each pond. These pictures show the three locations along with the gage sight where traps were set.



## DISCUSSION

Removal of nonnative fish is most critical for conservation and restoration of the least chub. There are many methods to remove nonnative fish, but none are as practical and effective as piscicides. Trout restoration projects use rotenone for nonnative fish removal (Finlayson et al., 2005). Rotenone is by far the most common and widely used fish toxicant. It's used because it is relatively safe and has low toxicity to birds and mammals. The disadvantages is that it doesn't work in very cold or highly alkaline water. Toxaphene is the second most widely used fish toxicant, but is highly toxic and can persist for years. These toxicants should be used for complete eradication of nonnative fish in these ponds and ponds must be protected from reintroductions of nonnatives. Reintroduction or incomplete eradication of nonnative fish would not eliminate the threat to least chub survival. Poisoning of Avocet and Teal ponds with rotenone is recommended. Avocet Pond might be easier to poison because it's not as deep, doesn't contain a lot of aquatic vegetation, and is more open than Teal Pond. Avocet Pond also sits farther away from the Plain City Canal where reintroduction of nonnative fish may be less likely.

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