

# Gulf Killifish

*Fundulus grandis*



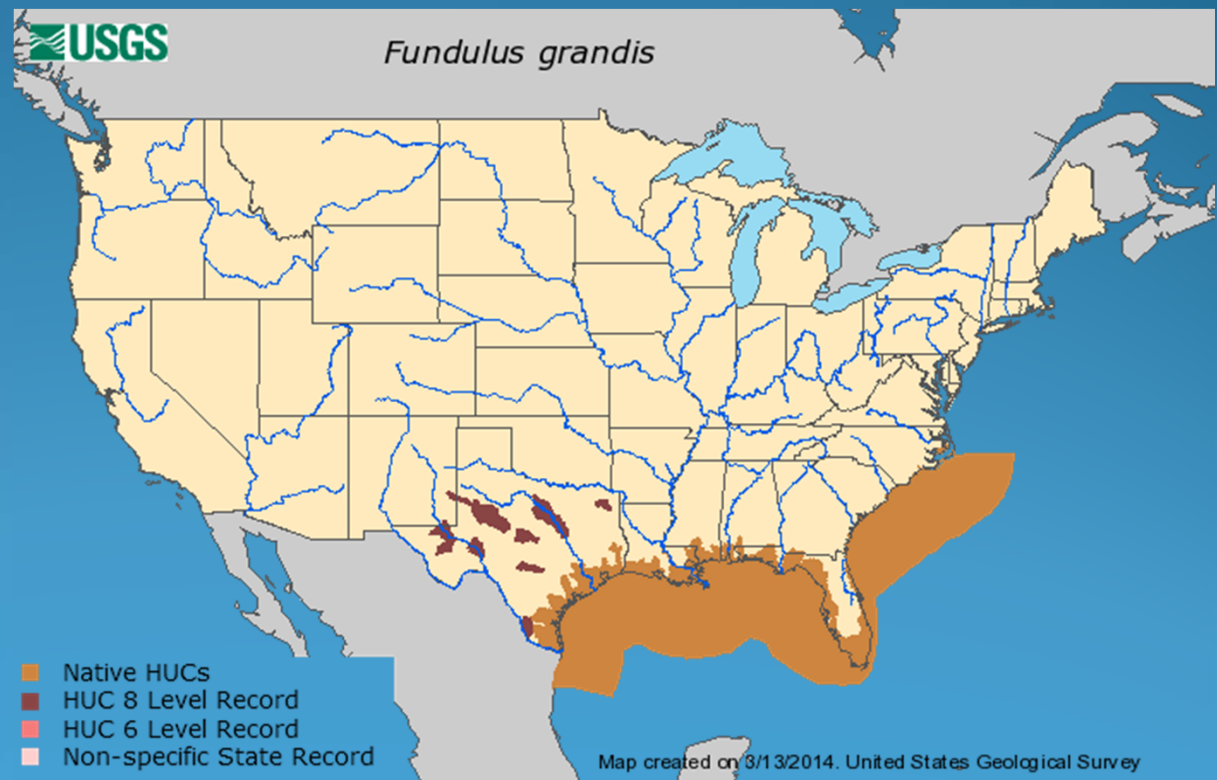
Fishes of Texas - *Fundulus grandis*  
[www.fishesoftexas.org](http://www.fishesoftexas.org)

# Other Common Names

- Bull minnow
- Mud minnow
- Chubs
- Cigar minnows
- Cocahoe minnows

# Where are they located?

- In brackish & salt waters
- Ranging from northeastern Florida, to Key west & Northern Gulf of Mexico to Cuba.



# What do they look like?

- They have a blunt head & short snout.
- An average of 6 inches long
- Extremely tough fish, able to survive in low oxygen, drought, high temperature, & freezing water.



Male



Female

# What do they eat?



Anchovies



Other Killifish



Benthic Algae



Small Crustaceans

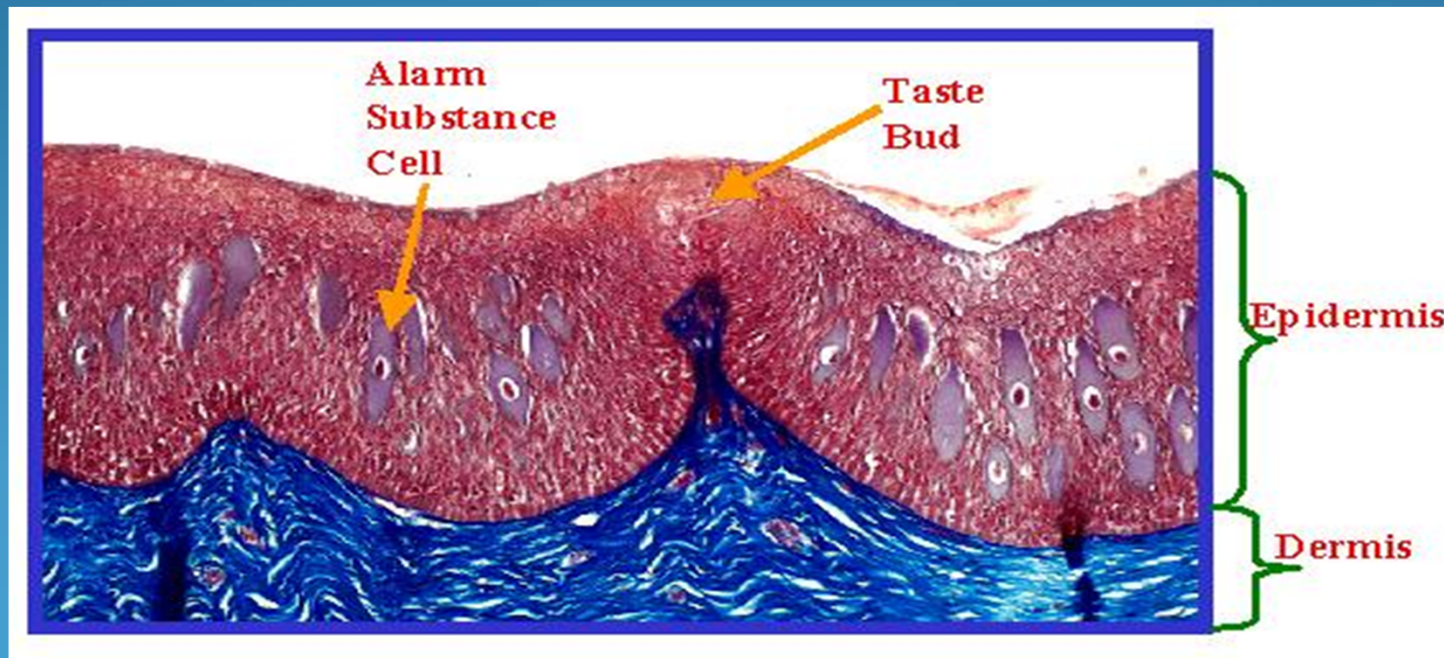
# How do they reproduce?

- Spawning season: March to September
- Process: eggs are deposited on vegetation during a spring high tide and left to develop, exposed to the air. They are incubated out of water in sufficiently humid environment.



# Alarm Substances

- “Alarm substance” is secreted by specialized cells in the epidermis (skin). It is released only when the Gulf Killifish is injured or dead.



# What did we ask?

- Question: Does the gulf killifish react to the presence of alarm substance and essence of crab?
- Alternative: The gulf killifish will react to the alarm substance and to the essence of crab.
- Null: The gulf killifish will not react to either substance.

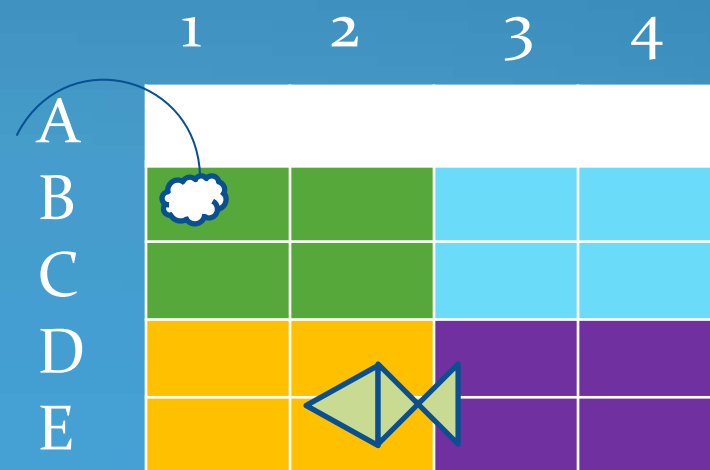
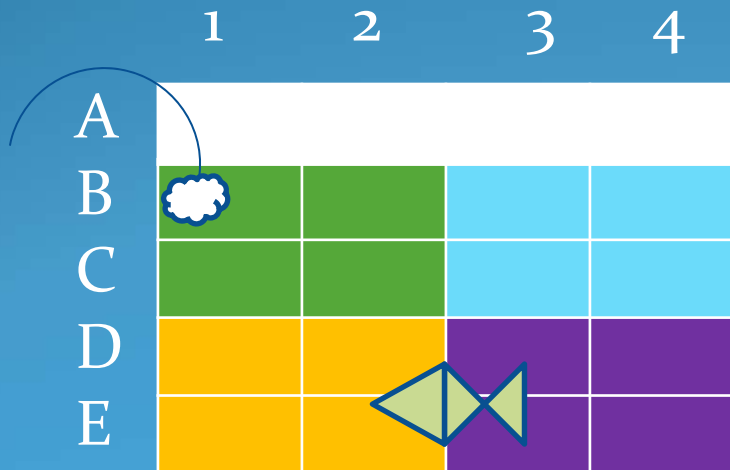




# How did we design it?

- 2 tanks were filled with about 5,000 ml of brackish water in each (15 ppt)
- Put gravel at the bottom of the 2 tanks
- we drew a 5x4 grid on the tank with an expo marker
- 2 gulf killifish – 1 in each tank
- To limit visibility we put 1 tray on the top of the tank and 1 on the back side of the tank.
- We acclimated the fish for two hours.
- Film the first 20 minutes while they are calm, so we will have a control record.

- We used a cotton ball to soak up the water containing the alarm substance.
- We used a cotton ball to soak up the water containing essence of crab.
- After adding both substances we left the film on for another 20 minutes.



# What are our results?

1 <sup>st</sup> 20 min. w/o substance	Description
Tank 1	Did not stay in the same place for more than 15 seconds, movement was erratic
Tank 2	Movement was erratic

2 <sup>nd</sup> 20 min. w/ substance	Description
Tank 1 Alarm Substance	Stayed completely still in D <sub>3</sub> for 1 min, Stayed in E <sub>3</sub> for 1 min, Stayed completely still in E <sub>4</sub> for 5 min, Stayed in row E for 1 min, stayed in column 4 for 1 min, at 7 min the fish began to have erratic movement, but never went in Q <sub>1</sub>
Tank 2 Crab Essence	Stayed in Q <sub>3</sub> & 4 for 1 min. 30 sec. Stayed in Q <sub>1</sub> & 2 for 1 min. 30 sec. Remaining 15 min. there was erratic movement

# Control for Crab Essence

(time elapsed 20 minutes)



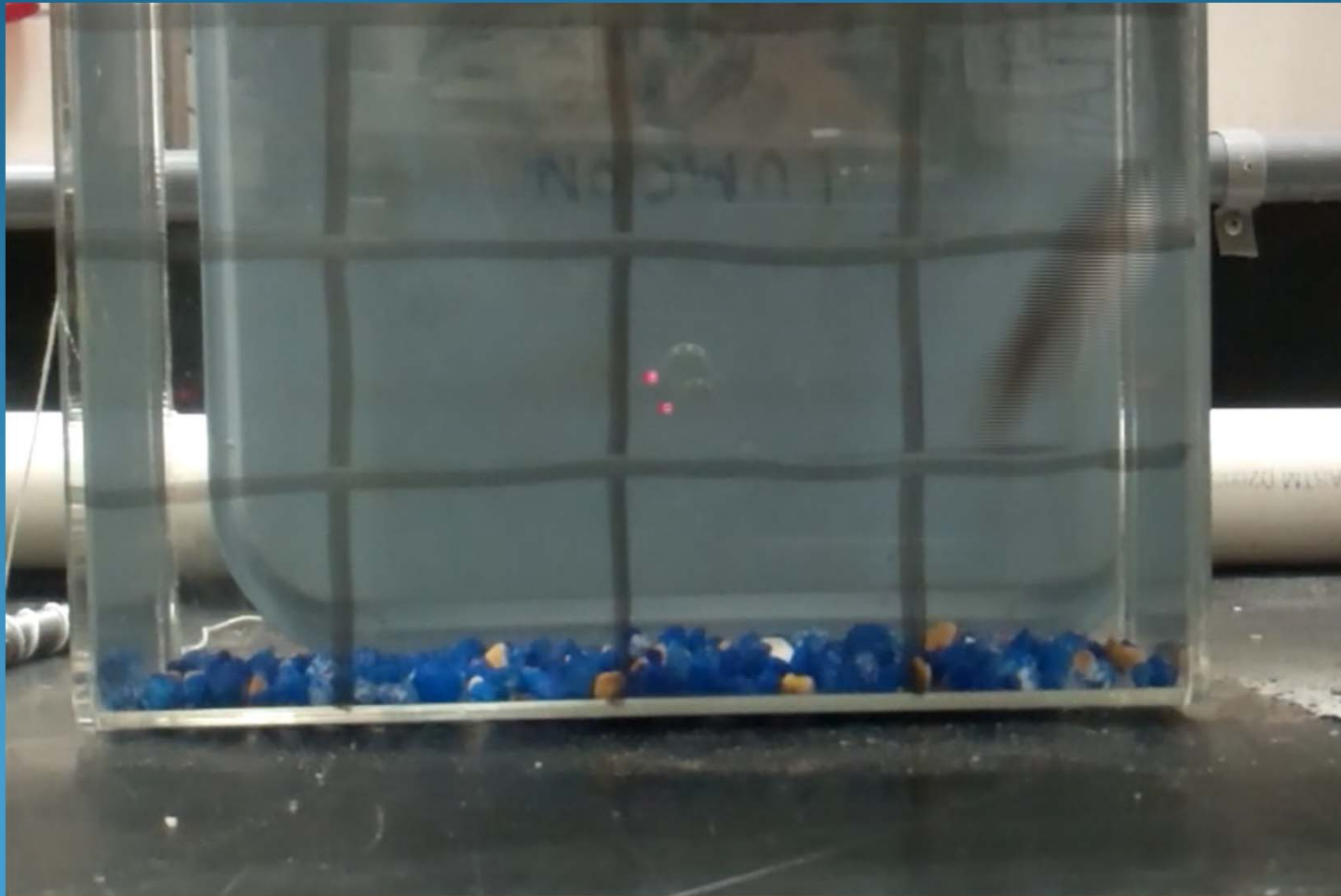
# Control for Alarm Substance

(time elapsed 20 minutes)



# Presence of Crab Essence

(time elapsed 20 minutes)



# Presence of Alarm Substance

(time elapsed 20 minutes)



# What did we conclude?

Our alternative hypothesis is supported by our results. The alarm substance in tank 1 showed significant reactions. The crab essence in tank 2 did not produce a strong fright response, but there was a change in behavior.



# How can we improve?

- We could use a different type of fish beside a Gulf Killifish to see if they would react to other species alarm substances.
- We could run more trials, and use more tanks.
- We could come up with a way to quantify the reactions.
- We could have the tanks in a more closed off area.

# Sites

- "Louisiana Fisheries - Gulf Killifish." Louisiana Fisheries - Gulf Killifish. N.p., n.d. Web. 23 July 2015.
- "Gulf Killifish (*Fundulus Grandis*) - FactSheet." *Gulf Killifish (Fundulus Grandis) - FactSheet*. N.p., n.d. Web. 23 July 2015.
- "Alarm Substances." *Encyclopedia Britannica Online*. Encyclopedia Britannica, n.d. Web. 23 July 2015.

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