

July 29, 40. #1

✓ Was up before the sun and went fishing in the "Bottomless lakes" near Roswell. These are a series of small ponds mostly less than 100 yards in diameter which were formed by limestone? sinks. They are all with clear white water, very alkaline and salt, at least definitely brackish.

WJK40-07-29-01

Caught two\* green sunfish, and saw a largemouth bass and a flier, in "Pasture lake". Went on to "Jugger-jug" lake and

WJK40-07-29-02

saw that Cyprinodon was spawning. Went back to camp and announced change of plans and ate a hurried breakfast.

6:55 AM. A. 79 W 79.

Cyprinodon spawning

about 6:30 AM noticed that males were guarding territory and at approximately 6:45 saw a pair spawn.

7:34 A pair mated several times in rapid succession. The male worked on both the right and left sides of the female. The action took place over some salt vegetation.

\* 3 in collection.

July 29, 1940 #2.

7:40 A male circled ~~over~~ a ♀ once a small (six inches across) bare area. They stopped once and may have spawned at this time.

7:47. A pair spawned once above vegetation. The ♀ stopped, the ♂ placed himself alongside and they mated. The male holds is dorsal quite erect during the process.

The males appear bluish in the water. Some are an intense blue <sup>all over</sup>, others have intense blue saddle marks and some others (post their prime?) and rather pale. The ♀s appear rather brownish after the fashion of the young. Their saddle marks are quite distinct.

7:53 A pair spawned 3 times in the vegetation. The ♂ was on the right twice and on the left once. Before they spawned, they did considerable twisting and turning as if the ♂ were trying to force the female to the bottom.

7:54 A pair spawned several times as above.

During the act, the ♂ leans slightly over the female and curves his tail away from her and vibrates.

July 29, 1940 #3

7:56 On two occasions males tried to mate with a female but she would not stop. During the process, the  $\sigma$ 's swimming around <sup>over</sup> in front of  $\phi$  as if showing off.

7:57 During spawning the  $\sigma$  is slightly posterior to the  $\phi$ .

1:59 A pair spawned once the vegetation. They maintained their position for several seconds, the rather longer than usual. The  $\sigma$  is almost a head length behind the female with both his caudal and dorsal fins arched away from her.

8:04 AM. The  $\phi$  was just seen to hold her tail in the same position as the  $\sigma$ . The male tried to encourage the female to the bottom by nudging her snout from above on one side.

A. 80

CO 79

8:00 AM.

While males and females occupy the same area, the females are nevertheless separated from the males except when there seems to be a desire (more or less) to spawn because they are usually much nearer the

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surface than all the males. The latter remain about two inches above the substratum - actual bottom or tips of weeds. The territories of the males range in depth from about two inches to one foot. They probably run deeper but I could not be sure that the fish seen beyond that depth were ♂'s guarding areas.

A female was observed to feed immediately after the completion of the spawning act. Males will also stop in their activities to pick objects of the bottom or the weeds.

The males remain <sup>about their territories</sup> with their fins lowered until pursuing a female or rival male when they erect all their fins and swim in a rather stiff fashion.

8:30 Just observed a fight. This is the first actual combat. Males are perpetually chasing each other without signs of much ceremonial or true fighting. Each male attempted to bite the side of the other in about the thoracic region, as a result they whirled

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about clockwise. 

8:32 another fight - went around clockwise.

8:45 A pair spawned three times, the ♂ using both the right and left sides of the ♀. Thought that the first time, the pair spawned when about half an inch off the bottom.

Small individuals made two attempts to bite each others side.

9:00 AM. A 81 10 81

A few of the small individuals 1.5-2 cm S. L. show pregnancy. Some appear to show signs of breeding color.

One pectoral fin appears to be under the female, the other vibrates with the D & C. during the spawning act.

"Pasture Pond" - Searched a few

WJK40-07-29-03

Lea Lake - Searched one end of this lake where the water is shallow. The bottom is relatively hard for these lakes, open and rather white from the salts? deposited on top. Depth 3' - 0.

The "Dambusia" in the collection were taken in the weedier shallows - emergent veg.

A young painted turtle was seen.

July 29, 1940 #6

"Pasture Pond" This is the weediest of all of the "Bottomless lakes". A narrow ring of cat-tails surrounds the lake. Submerged vegetation occurs more abundantly here than elsewhere. Many *Gambusia* were taken once a gravelly bar bordered an either side with vegetation. They were also common just over the vegetation. The embranchids were in the deeper water just off the edge. A dead musk (or mud) turtle was ~~not~~ found.

WJK40-07-29-04

Seined an alkaline pond near the "Bottomless lakes". It is similar except in depth. This is with clear white water, rather shallow. Weeds were growing out in the middle. The bottom <sup>(musk)</sup> is somewhat harder than in the deeper lakes but is underlain by the same foul-smelling material. Veg. was abundant. *Cyprinodon* was abundant. Fleather forms were scarce.

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WJK40-07-29-05

Searched the Rio Felix at the crossing  
of Highway 285 near Hagerman  
A. 80 W 76 T. : 8:45 P.M.

The bottom is of rubble and boulders with  
some mud in the pools. The water is clear  
white with a slow to moderately strong current.  
The size varies from 2 inches deep and <sup>ten</sup> four feet  
wide to 75 feet wide and four deep. It consists  
largely of a series of large pools separated  
by small riffles. Vegetation, algae, is  
abundant.

Dorosoma - Two captured by hand in  
a riffle. About twenty were found dead in the  
edge of the riffle.

Macrostoma several small ones taken  
under the shelter of a bank. One large one  
about 18 inches long found dead and rather  
badly spoiled.

Detarium punctatus were found in  
the shallow riffles midw rocks. These appear  
to be ~~the~~ much grayer in color than those  
taken in Illinois or at Santa Rosa.

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The young cats are dark gray and ~~were~~ found under stones in the ripples along with the darters. Some also came from the shallow pools.

Notropis "Leptolepis-aides" were found in the slacker waters of the ripples.

Cyprinus carpio. One large specimen about 22 inches long released.

One Notropis luteus cross in breeding color.

Ptychocheilus were largely at the tails of the ripples as were the Hypanis megalotis.

One musk turtle seen.

The slender sunnys were mostly in the pools.