Inventory of the Herpetofauna of the Natural Area Teaching Laboratory at the University of Florida

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Introduction

The purpose of this project was to perform a species inventory of the herpetofauna at the Natural Area Teaching Laboratory (NATL) area at the University of Florida. Data collected during this project enhances current information about the amphibians and reptiles at NATL. Traps and other sampling methods were employed in the upland pine, hammock, old-field, central marsh, and Stormwater Ecological Enhancement Project (SEEP) areas. These methods included: drift fence arrays with funnel and pitfall traps, PVC pipe refuges, aquatic traps, area-constrained searches, and aural surveys. This project was funded by the 2012 NATL Minigrant Program. Brittany Grzybowski conducted this project for honors credit in WIS 3402, under the direction of Dr. Johnson.

Materials and Methods

Installation of the Drift Fence Arrays, PVC Pipes, and Aquatic Traps

Before setting the traps, the three major upland habitat areas of NATL were surveyed and appropriate locations for the drift fence arrays were chosen in consultation with the NACC Chair (upland pine—grid block C9, old field—grid block G4, and hammock—grid block L7). Next, three trenches were dug at each location. The trenches were each ~ 20 feet long, 1 foot wide, and 8 inches deep and radiated out from a center location (**Figure 1**).

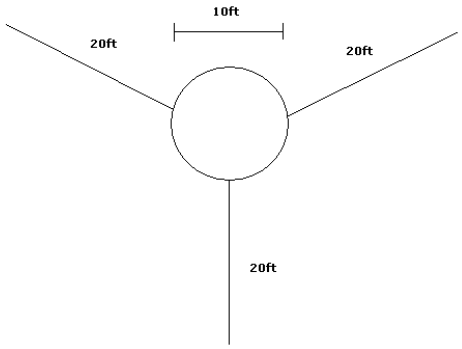

Figure 1. *Dimensions of the trenches dug for the drift fence arrays.*

Once the trenches were dug, sheets of 20-ft. long pieces of aluminum flashing were cut from a roll and inserted, standing vertically, into each of the trenches. The dirt that was previously dug out of the trenches was then packed back in around the flashing in order to hold it in place.

In the academic sampling section of the hammock area a more permanent drift fence was installed using steel flashing instead of aluminum flashing. Additionally, at both ends of each piece of steel flashing, holes were dug for pitfall traps. Six buckets (5-gallon capacity) were used as pitfall traps, each of which had several small holes drilled in its bottom in order to let water drain out. The buckets were buried level with the ground. In order to ensure that no animals fell into the traps when a trapping session was not occurring, lids were snapped in place over the bucket tops.

Each of 18 funnel traps were made from wire window screen. Funnel traps were about 3 feet long and 1.5 feet wide. An initial piece of screen was folded along its length, aligning the two edges to create a cylinder. Then these edges were folded over twice, with each fold being

about 1 inch in width. After each of these two folds, staples were put along the fold to reinforce it (**Figure 2**).

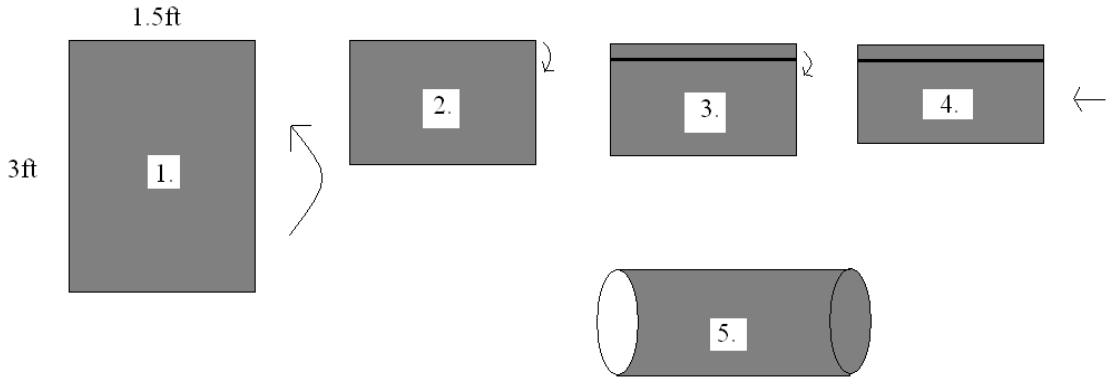

Figure 2. *How to form the cylindrical section of the funnel traps.*

Funnels were then made from the window screen using a cardboard cutout as the template for cutting. The pieces of screen were formed into a funnel by rolling the piece of screen so that the two straight edges overlapped. These edges were folded over and secured with staples (**Figure 3**). As shown below, these funnels were inserted into one or both ends of the cylindrical sections of the traps, depending on the specific type of funnel trap desired (single- or double-ended).

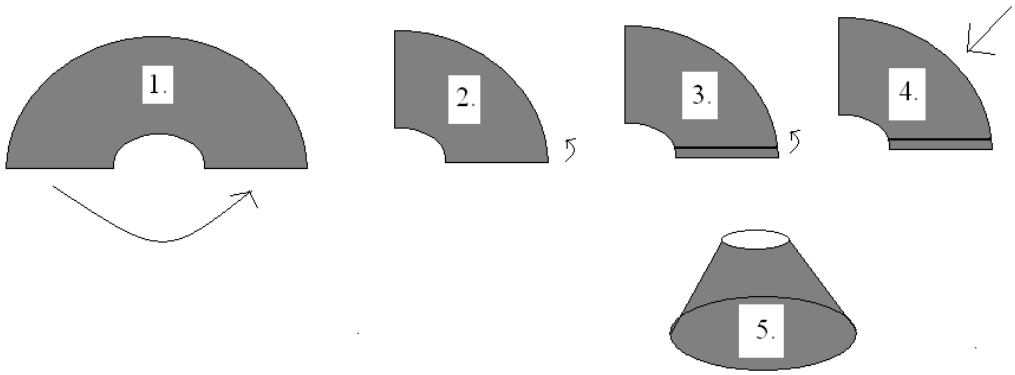

Figure 3. *How to form the funnels for the traps.*

Each funnel was placed, small-opening-end down, into the center body section. The part of the funnel that stuck out over the cylinder was cut down in strips and folded down over cylinder in order to hold it in place. For the 12 traps with single funnel ends, staples were placed along the edges where the funnel flaps were folded over the cylinder in order to hold it in place. For the 6 traps with double funnel ends, staples were placed on one side and binder clips were used to hold the funnels flaps in place on the other side of the trap (**Figure 4**).

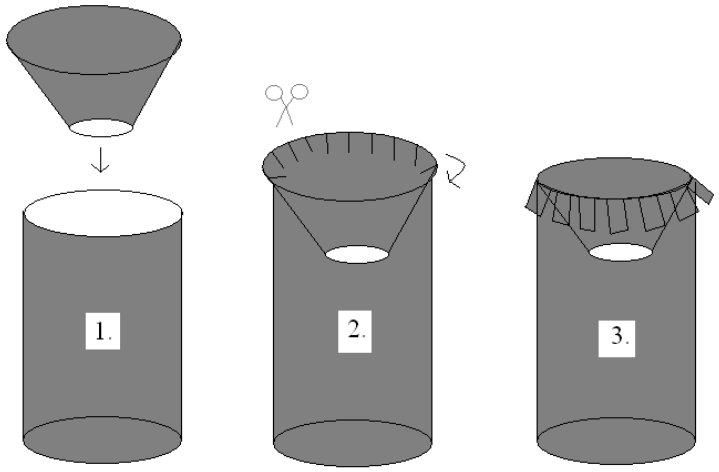

Figure 4. *How to attach the funnels to the cylindircal section of the trap.*

For the 12 traps with single funnel ends, the open ends of the traps were then folded together and two 2 inch folds were made along the ends. After each of these two folds were made, 5 binder clips were put along the fold to reinforce it (**Figure 5**).

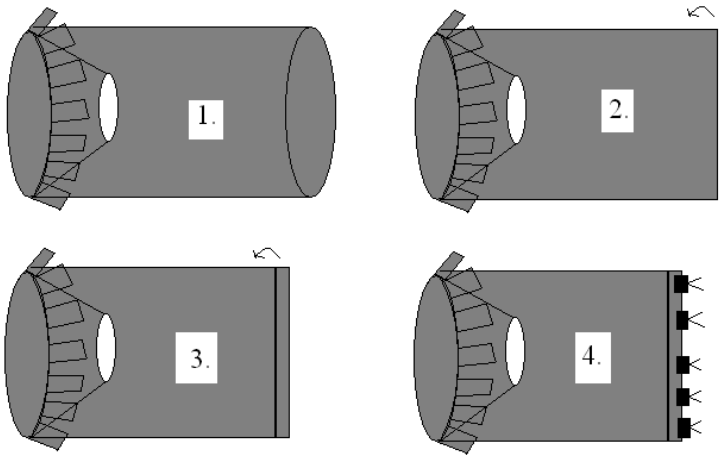

Figure 5. *How to form the closed ends of the traps with single funnel ends.*

For the two drift fences in the upland pine and old field areas 12 traps were made with one funnel end and one closed end (i.e., single-ended trap). For the more permanent array in the hammock area, the 6 traps were made with a funnel at each end (i.e., double-ended trap).

PVC pipes were also utilized, not to trap the animals, but as a refuge and inventory tool for frog species. In the upland pine, old field, and hammock areas 6 PVC pipes, each about 4 feet long and about 1.5 inches in diameter, were placed upright into the ground at the ends of each section of flashing. In the central marsh area, an additional 25 PVC pipes placed around the water's edge at the western edge of the marsh to specifically monitor for Cuban Treefrogs.

In the central marsh area near the permanent drift fence array in the hammock section of NATL, 5 aquatic siren traps were placed into the water at scattered distances from each other. In the SEEP area, 5 double-ended wire minnow traps were placed into the water at scattered distances from each other.

Trapping Sessions

In preparation for a trapping session, all drift fence array sites were searched for fire ant hills and Amdro® was sprinkled on any found. Also, a brick-sized sponge was placed inside each funnel trap and soaked with water to provide a water source for trapped animals and a piece of cloth, about the same size as the funnel traps, was draped over each funnel trap to provide shelter. A sponge was also placed in the pitfall traps and soaked with water. The funnel traps were then positioned so that they were as flat to the ground and as flush to the drift fences as possible. At the upland pine and old field areas, funnel traps were place at the ends of the drift fences as shown in **Figure 6a,** and at the hammock area funnel traps were on each side of the drift fence flush to the metal sheeting, and pitfall traps were at the ends of the fences (**Figure 6b)**.

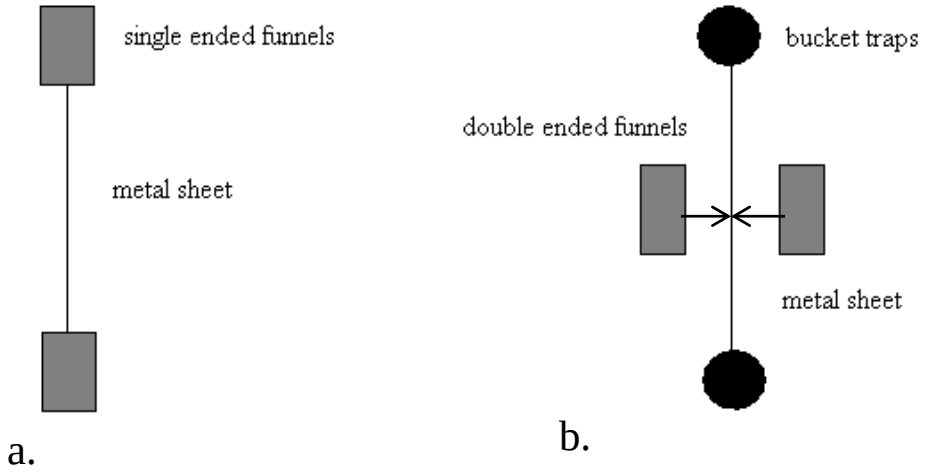

Figure 6 a,b. (a) *Drift fence trap array setup at the upland pine and old field sites.* (b) *Drift fence trap array setup at the hammock site.*

Each trapping session occurred over a three-day period. On the first day, the traps were set and opened. Then, 24 hours later (typically in the morning around 9AM) the funnel traps, pitfall traps, aquatic traps, and PVC pipes were checked and the species found were inventoried, photographed, and released. No animals were marked, so individuals in this study could not be identified. Animal trapping was approved by the UF IACUC for Dr. Johnson's class Wildlife of Florida (WIS 3402). The funnel and pitfall traps were then reset, using the procedures outlined in the above paragraph and the aquatic traps were placed back into the water. On the third day, the traps were again checked and the species were inventoried, but afterwards the traps were picked up or closed so that no additional animals would be trapped between trapping sessions. Overall, four three-day trapping sessions utilizing the funnel and pitfall traps were conducted in the spring of 2012. The first trapping session began on March 30th, the second session began on April 13th, the third session began on April 30th, and the fourth began on June 5th. The 5 aquatic siren traps used in the central marsh area were deployed from April 13th to the 15th in an area close to the hammock drift fence array and from May 1st to the 2nd along the central marsh board walk. Minnow traps were deployed in the SEEP area May 1st and 2nd.

Additionally, two area-constrained searches were conducted in a recently burned section of the upland pine. These searches involved four to five volunteers, spread out in a line, walking slowly and looking under logs and debris, raking through leaf litter, and checking plants and tree trunks for amphibians and reptiles. If a log was overturned, it replaced once it was checked. Again, any species found were inventoried and photographed. The first search, performed on May 1st, occurred in the northern-most plot of the burned upland pine section. And the second search, performed on May 2st, occurred in the burned upland pine plot just south of the northernmost plot. Species observed incidental to checking traps were also documented.

Aural surveys, conducted after dusk, of the marsh area were also performed to aid in identification of frog species based on their calls. One survey was conducted the night of April 5th, after a light rain. A second aural survey was conducted the night of May 28th after heavy rains from tropical storm Beryl. Frog calls heard during trapping sessions were also noted.

Results

Overall Captures and Observations of Herpetofauna

A total of 18 species of amphibians and reptiles was directly trapped or observed and evidence of an additional reptile was seen (i.e., Gopher Tortoise burrows were observed, but no tortoises). These included 13 species of amphibians (11 frogs, 2 salamanders) and six species of reptiles (1 snake, 3 lizards, and 2 turtles—including the tortoise burrow observation). Different species were encountered with different methods, and no species was encountered with all methods used (**Table 1**). Three introduced species were detected: 1) Cuban Treefrog, 2) Greenhouse Frog, and 3) Brown Anole. The vast majority of these had been documented at NATL prior to this study as seen at the NATL website. Nonetheless, four species were observed that had yet to be recorded on the property according to the NATL website as of July 2012. These included an Eastern Glass Lizard, a Yellow-bellied Slider, a Little Grass Frog, and a Two-toed Amphiuma. The glass lizard was observed dead near the northern entrance to the academic use area of the hammock. The Little Grass Frog and the amphiuma were observed during the aural survey on May 28th. The frog was heard calling at the SEEP, and the amphiuma was seen in shallow water at the northern end of the boardwalk at the eastern edge of the marsh. On April 15 Dr. Johnson observed a student releasing a Yellow-bellied slider, which had been found on a

Gainesville road, into the central marsh and he later observed another Yellow-bellied Slider (maybe the same animal?) in the SEEP.

Table 1. *Herpetofuana species encountered with various methods at NATL during the study. Methods: ACS = area-constrained search, AS = aural survey, FT = funnel trap, MT = minnow trap, OBS = observation ancillary to checking traps, PFT = pitfall trap, PVC = PVC pipe refuge, ST = aquatic siren trap*

Species	Method
AMPHIBIANS	
Frogs	
Pine Woods Treefrog	AS
Green Treefrog	AS, PVC
Squirrel Treefrog	AS, PVC
Cuban Treefrog	AS, OBS, PVC
Little Grass Frog	AS
Eastern Narrow-mouthed Toad	ACS, AS, FT, PFT
Southern Toad	OBS, PFT
American Bullfrog	AS
Bronze Frog	AS
Southern Leopard Frog	MT
Greenhouse Frog	AS, PFT
Salamanders	
Peninsular Newt	ST
Two-toed Amphiuma	OBS
REPTILES	
Snakes	
Black Racer	FT, OBS
Lizards	
Little Brown Skink	ACS, OBS
Brown Anole	OBS
Eastern Glass Lizard	OBS
Turtles	
Gopher Tortoise (burrows)	ACS
Yellow-bellied Slider	OBS

Drift Fence Arrays & PVC Refuges

Only six species (5 amphibians and 1 reptile) were captured in the drift fence arrays and PVC pipe refuges. Although the fewest captures were seen at the hammock array (5 total), captures there were of five different species of frogs. There were 17 captures of 4 species at the old field site, including the only two snake captures of the study—both of which were Black Racers. There were 50 captures at the upland pine site and these were dominated by captures of Squirrel Treefrogs in the PVC pipes (**Table 2**).

Table 2. *Number of individual herpetofaunal species captured at drift fence arrays in funnel traps, pitfall traps, and PVC pipe refuges in the three upland habitats sampled at NATL.*

Species	Old Field	Upland Pine	Hammock
AMPHIBIANS			
Frogs			
Green Treefrog	2		1
Squirrel Treefrog	7	48	1
Eastern Narrow-mouthed Toad	6	2	1
Southern Toad			1
Greenhouse Frog			1
REPTILES			
Snakes			
Black Racer	2		
Total Captures	17	50	5

A single Cuban Treefrog was observed among the 25 PCV pipes deployed along the central marsh in an attempt to document this species. Numerous Green Treefrogs were observed in these same pipes.

Aquatic Trapping

The use of siren traps and minnow traps resulted in captures of Southern Leopard frogs and Peninsular Newts. Six Southern Leopard Frog tadpoles nearing metamorphosis were

captured in minnow traps deployed in the SEEP wetland on May 2nd. A total of 28 Peninsular Newts were captured on the same day in siren traps at the central marsh.

Aural Surveys

Aural surveys conducted during several nights and augmented with calling frogs heard incidental to checking the traps at the arrays detected nine species of frogs. Four of the frog species encountered during the study were only detected by their calls. These included the Bronze Frog, American Bullfrog, Little Grass Frog, and Pine Woods Treefrog. On the survey conducted during rains generated by tropical storm Beryl there was a deafening chorus at the SEEP wetland that was dominated by Green and Squirrel Treefrogs. Several Eastern Narrow-mouth Toads and a Little Grass Frog were also heard. That same night there was a large chorus of Green Treefrogs and several Eastern Narrow-mouth toads heard at the marsh.

Additional Observations

The area-constrained searches in the burned areas of upland pipes revealed two Little Brown Skinks and two Eastern Narrow-mouth Toads. Several abandoned Gopher Tortoise burrows were seen but none of these appeared active an there were no observations of live tortoises. Several additional species were observed during walking among drift fence array sites to check traps. These included species not documented with other methods (**Table 1**)

Discussion

The number of species detected was lower than what was originally expected based on the habitats sampled, potential species present, and prior knowledge of the herpetofauna at

NATL. Several possible reasons exist as to why this may have occurred. First, the weather conditions were not ideal for the species being inventoried. Throughout the sampling periods, the conditions were consistently cool and dry, only warming up towards the end of the study. Additionally, only a relatively small area of NATL was sampled over a relatively short period of time. Furthermore, population sizes of some species at NATL may be relatively small considering the fact that NATL is an isolated remnant of more expansive habitats in the past. Sampling effort coupled with low population sizes may well explain the dearth of captures for most species. Other possible reasons include the fact that many species are cryptic, making them difficult to observe without a thorough and extensive search and some expected species may no longer be present in NATL. If a species becomes locally extinct in NATL (e.g., via fire exclusion), it may be difficult for it to recolonize the site due to the fact that NATL is surrounded by roads, buildings, and other barriers to animal movements.

Despite the relatively low number of captures, this limited study documented numerous species of amphibians and reptiles. These included several species that apparently were documented at NATL for the first time. Three introduce species were found, and it is clear that Cuban are still breeding in wetlands at NATL. Despite this, populations of native frogs appear strong. Additional surveys are needed at NATL over time in order to fully document the species richness of amphibians and reptiles that occur on this unique and important natural area at the University of Florida.