Exotic Island Apple Snails and Kissimmee Grass

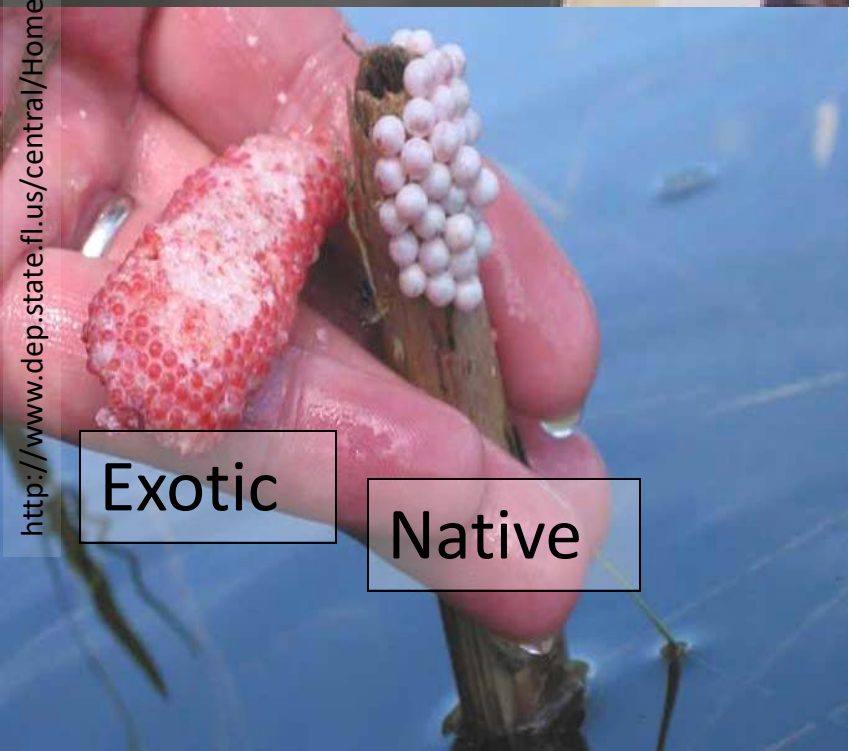
W.T. Haller, Jacob Thayer and Several Contributors

Center for Aquatic and Invasive Plants

wth@ifas.ufl.edu

UNIVERSITY OF FLORIDA
IFAS

http://www.dep.state.fl.us/central/Home/Watershed/snails/Snails.htm



Differences

- Size
- Clutch size
- Duration of egg-laying
- Food consumption?

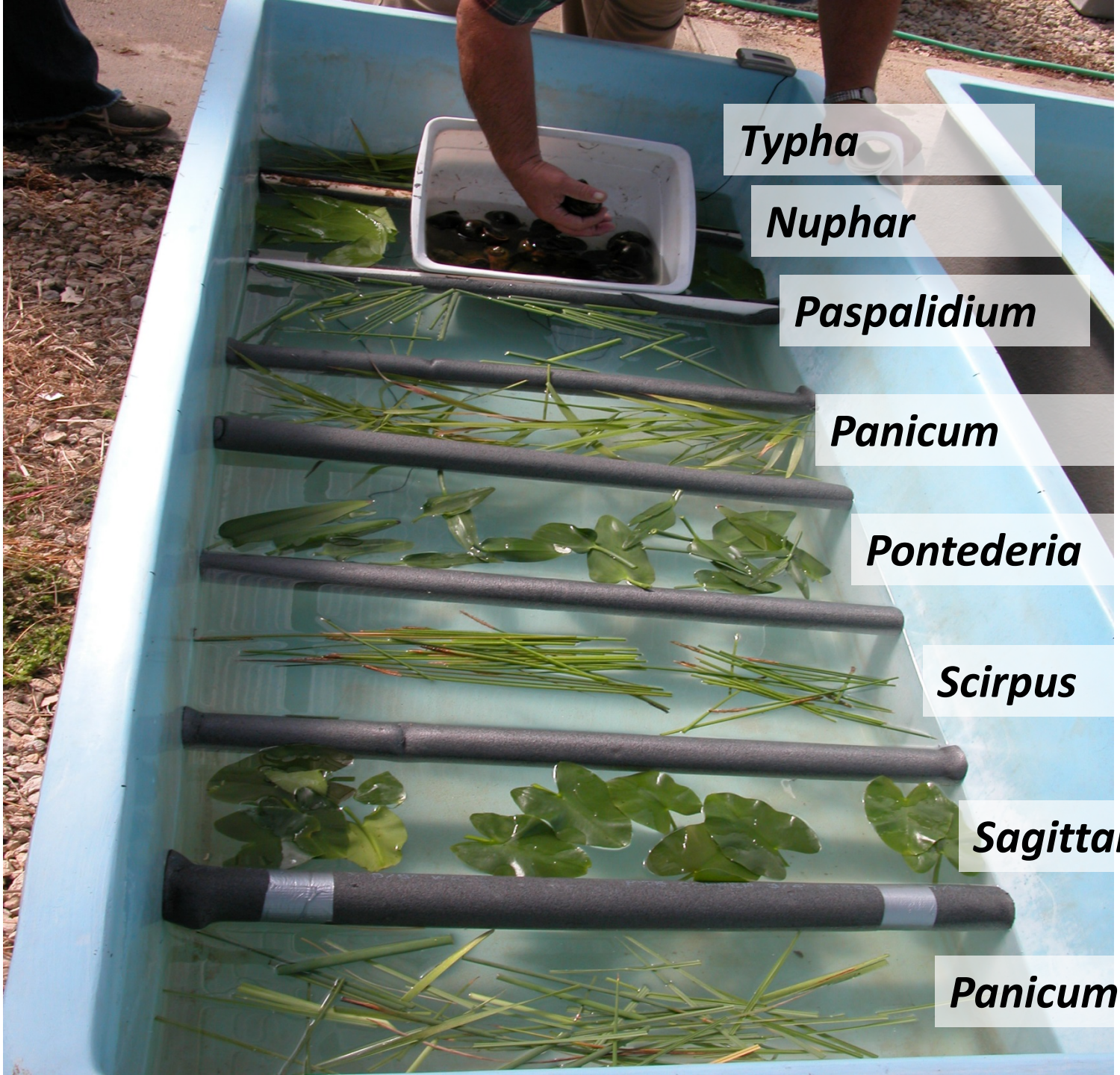

Typha
Nuphar
Paspalidium
Panicum
Pontederia
Scirpus
Sagittaria
Panicum

Figure 1A. *Paspalidium geminatum* on Lake Kissimmee in 2009 (Photo by Dean Jones)

Figure 1B. *Paspalidium geminatum* on Lake Kissimmee in 2016 (Photo by Dean Jones)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Experiment 1

No choice on Kissimmee grass

- Divided tank
- Control: 10 snails/Kissimmee grass
- 19 days


TANK
1
Control

Snail damage

K. grass (g dry wt)			
Tank	Control	Snail	% red
1	86.7	18.5	78.7
2	84.4	39.4	53.3
3	97.4	22.3	77.1
4	75.9	35.6	53.1
Mean	86.1	29.0	65.6
SD	7.7	8.8	12.4

Experiment 2

Hydrilla & K. grass (choice)

- Tank not divided
- Hydrilla one end, K. grass other
- 10 snails free access to either
- 26 stems, total length, weight(end)
- 8 days


Control


Rep 1 Ex 2

	Number of plants initial	Number of plants final	%(±)
Control	26	26	0
Tank 1	26	2	-92
Tank 2	26	10	-62
Tank 3	26	8	-69
Tank 4	26	19	-27
Ave. Change*	ø	-16	-62

Total length initial (cm)	Total length final (cm)	G dry wt./tank
746	1610	13.7
925	95	2.5
812	333	4.2
613	206	2.2
847	484	4.2

Experiment 3

(No Choice)

- Weight gain of snails
- Tank divided 10 on K, 10 on Hyd.
- Additional plants added
- Ran out of K. grass 21 days

Change (g)	grams/day/snail
hydrilla	
+30	0.29
+43	0.41
+30	0.29
+25	0.24
-	0.31±0.06
-	0.23-0.38 C.I.
Kissimmee grass	
+38	0.36
+24	0.23
+17	0.16
+23	0.22
-	0.24±0.07
-	0.16-0.33 C.I.

Table 4. Average daily gain for snails in the 3 experiments run in a greenhouse between August and November, 2017. Average snail weights were 35-45 g/snail during these studies.

See text	Food source	Ave daily gain/snail
Experiment 1	Kissimmee grass only	0.22±0.07 (0.14-0.31)
Experiment 2	Kissimmee grass/hydrilla	0.16±0.03 (0.13-0.19)
Experiment 3	Kissimmee grass only	0.24±0.7 (0.16-0.33)
	hydrilla only	0.31±0.66 (0.23-0.38)

Hydrilla = 2,200g F. wt./m^2

Native	Exotic
50g each	200g each
2g F. wt./day	8g F. wt./day
x 10 snails/m^2	x 10 snails/m^2
20g F. wt./day	80g F. wt./day
2,200/20=110 days	2,200/80=28 days

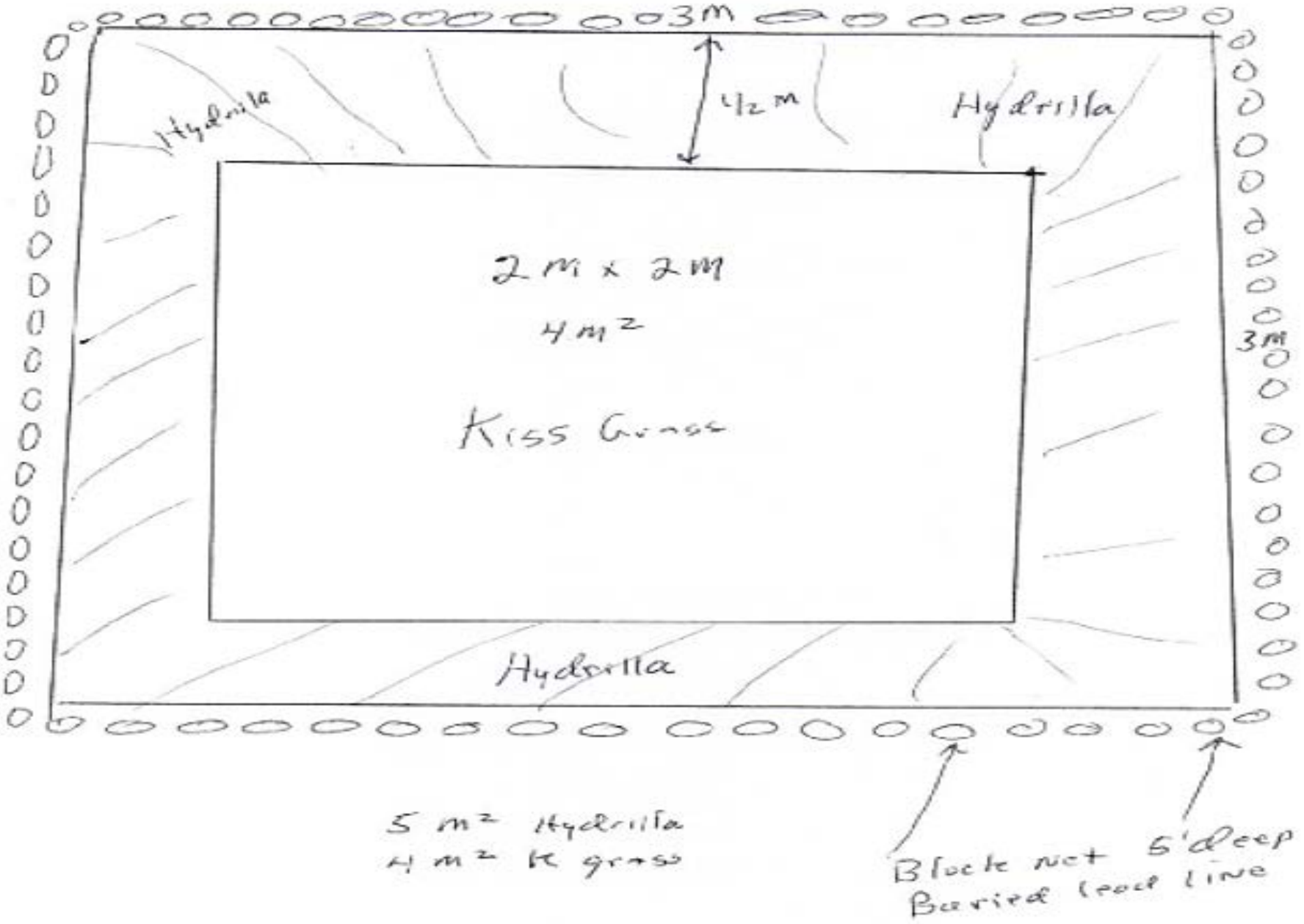
- Consumed more K.G. than expected
- Cut stems off-consumed at surface
- Probably eat new growth
- Likely cause of K.G. decline
- Field(small scale) trial not easy

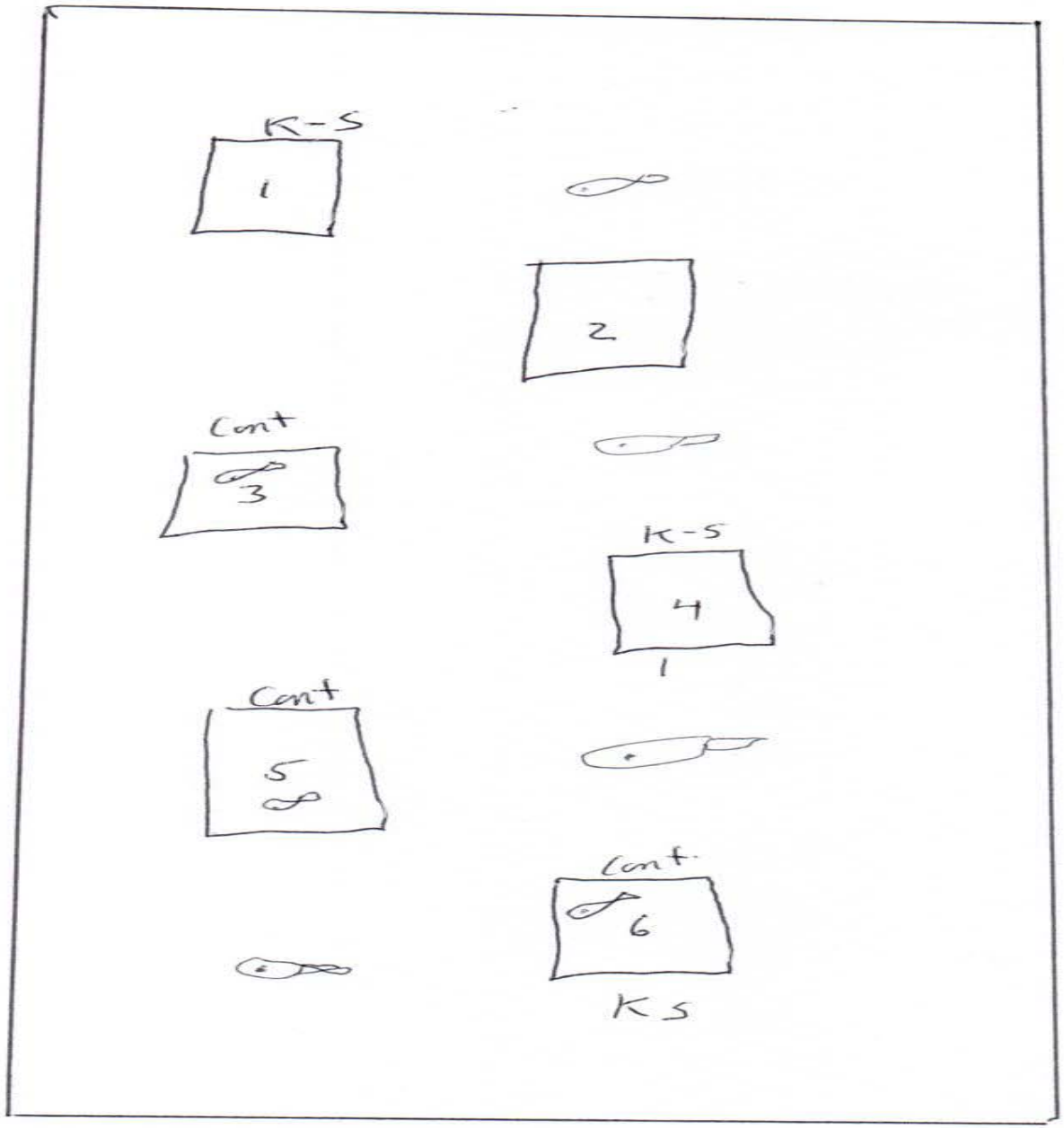
Field Study

- Limited Molluscicides
- Toxic to native snails
- Effects on KG sprouts
- Pond study at SFWMD ponds

1

Experimental Unit





3 Controls

3 w/ 10 snails/m^2
= 40 Snails

Stock pond w/
and Controls
w/ redear
Sunfish