

Advancement of Atlantic Croaker (*Micropogonias undulates*) Aquaculture

Dr. Nicole Kirchhoff

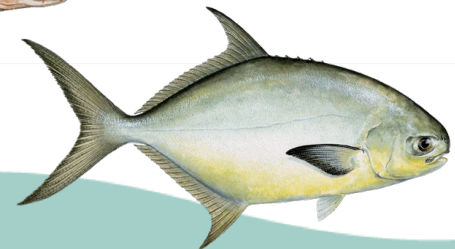
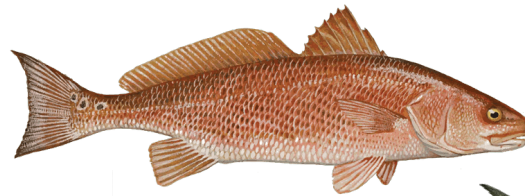
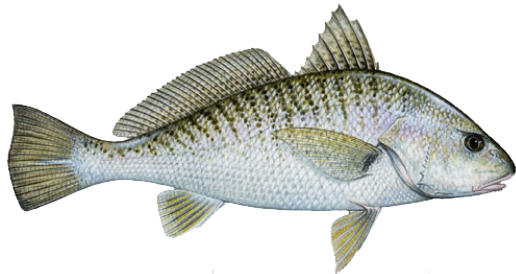
It's that simple!



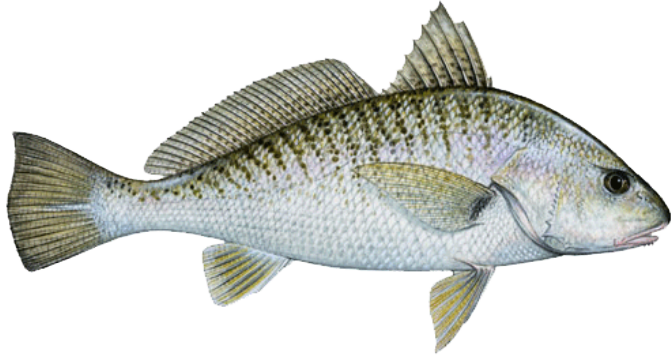
liveadvantagebait.com

About us...

Your premiere wholesaler of warmwater marine fish, fingerlings, and eggs for baitfish and foodfish grow-out, research, and restoration.



Atlantic Croaker (*Micropogonias undulates*)



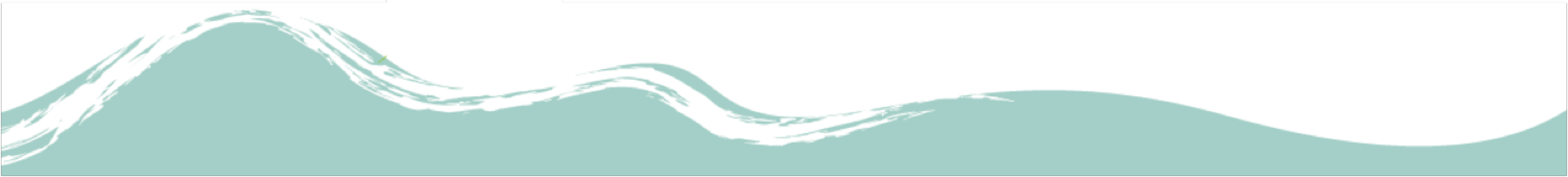
LIVE MARINE BAITFISH
REPRESENT A HUGE MARKET:
\$274 MILLION IN FLORIDA.

Why...

- ✓ Market as both live bait and food fish
- ✓ Hardiness and Ability to culture
- ✓ high market value:
Recently reported wholesale prices
exceeding \$3.00ea. and retail up to
\$5.50ea.

Why not...

- Reproduction consistency
- Questionable Market acceptance
- Quantify market demand



(1) Reproduction consistency

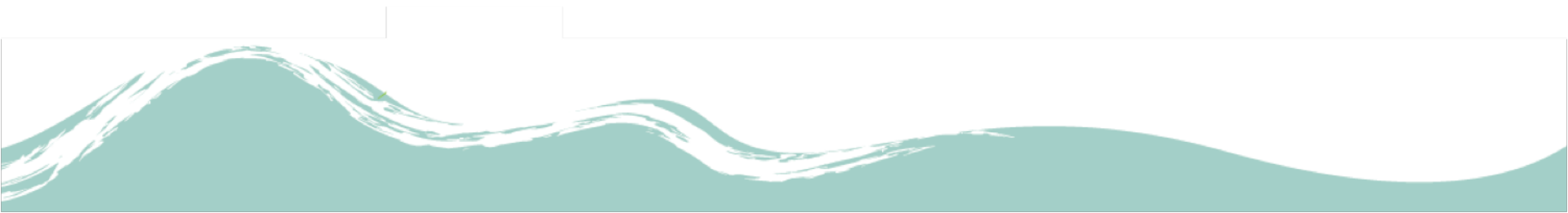
Out-of-Season conditioning

- Florida spawning season ~Nov-March*
- Previous research
 - can extend or advance season ~1month
 - 90 day, 120 day photo-thermal cycles don't work

Consistency of larval production

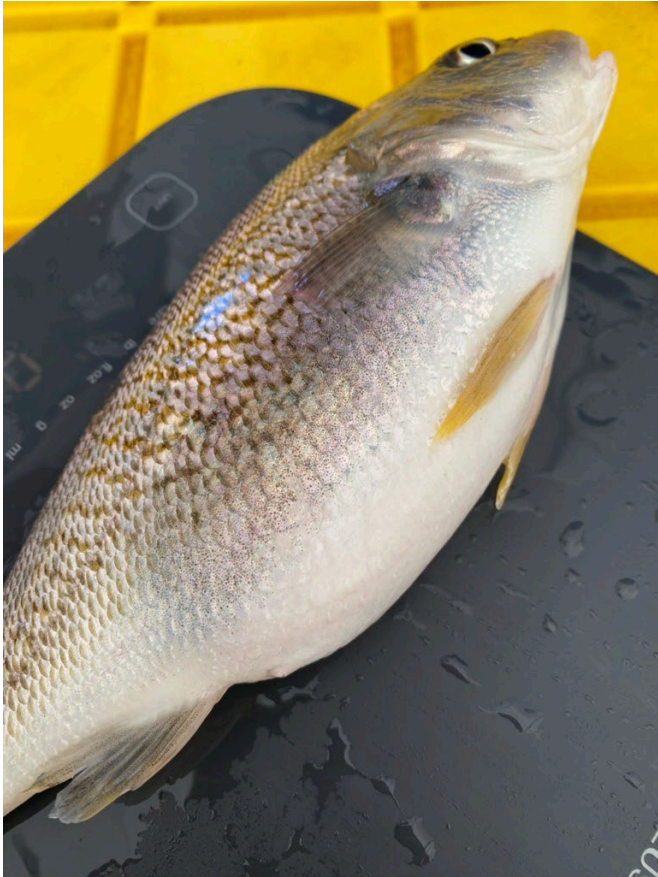
Previous research


- mostly direct to pond stocking
- unknown production performance



(1) Reproduction consistency

180 day photo-thermal cycle



 **Salt Water Sportsman** ✓
2h · 🌐

Soon you may be able to get your favorite bait at any time of the year.



saltwatersportsman.com
Croaker Hatchery Aims to Improve Baitfish Populations

(1) Reproduction consistency

larval production baseline data

- Females were found to spawn between 8 and 120,000 each spawn.
- Significantly more eggs per female were found the longer they were held in captivity.
- Percent fertilization was highly variable (range 8-91%) with an average of 63%.
- Of the fertilized eggs, percent hatch and survival to 2-days past first feeding was surprisingly low at an average of 61% (range 0-92.5%) and 20% (0-85%) respectively.
- Survival of fertilized eggs to weaning from 5-57%.
- Significantly better spawn quality was found with our slow release spawning implants compared to ovaprim.



(1) Reproduction consistency

future hatchery research:

- ✓ Broodstock diet
- ✓ Broodstock sex-ratios
- ✓ improve egg quality
- ✓ When is “season”



(2) Market Acceptance

Bait-shop Trials

- repeat 2016 pinfish trials
- 3 shops, one month

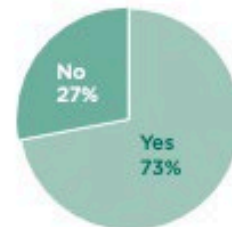
HOOK
LIVE ADVANTAGE BAIT,
CATCH MORE CUSTOMERS AND LAND
INCREASED REVENUES!

THE NUMBERS DON'T LIE.

Just look at how Live Advantage Bait benefited 3 bait shops in just 4 weeks!



1. NEW CUSTOMERS! In a 4-week trial, **3 bait shops** stocking Live Advantage Bait pinfish attracted an average of **54% new customers**.



2. MORE PURCHASES! **73% of those new shoppers** who bought our live bait  made additional purchases in the bait shops — an average of **\$24.30**.



3. INCREASED REVENUE! The addition of live bait to each store increased revenue, on average, by more than **\$249 per week**. Over the course of a year, that would add up to almost **\$13,000 in additional revenue**.

WHAT'S THE ADVANTAGE OF LIVE ADVANTAGE BAIT?

More new customers. More sales. Increased revenue.

It's that simple!

(2) Market Acceptance

Bait-shop Trials

average price \$2.25 each!
(\$4 ea. sold out)

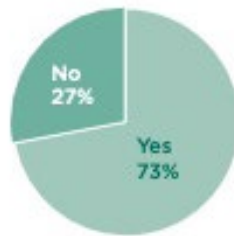
50-60% new customers



1. NEW CUSTOMERS! In a 4-week trial, 3 bait shops stocking Live Advantage Bait pinfish attracted an average of 54% new customers.



82% purchased an avg. \$38.45 other product



2. MORE PURCHASES! 73% of those new shoppers who bought our live bait made additional purchases in the bait shops — an average of \$24.30.



increase revenue

- * \$1380/wk
- * \$71,900/yr

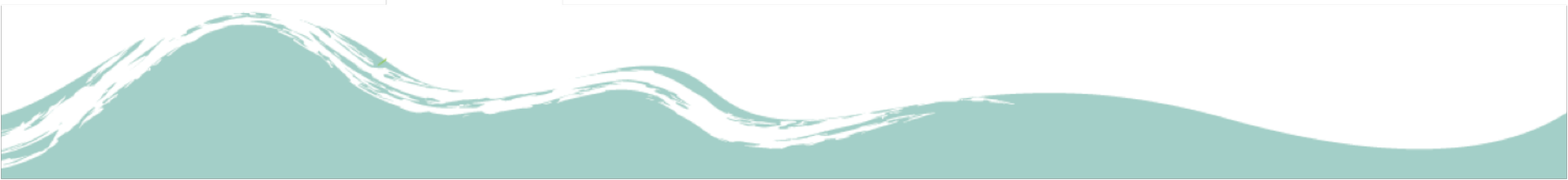


3. INCREASED REVENUE! The addition of live bait to each store increased revenue, on average, by more than \$249 per week. Over the course of a year, that would add up to almost \$13,000 in additional revenue.

(3) Quantify Demand Survey design: Who?

Business license volunteered category vs.
Florida Fish and Wildlife Licenses (1 year renewable)

SPL	WD	RC	RO
Saltwater Products License	Wholesale Dealer	Retail Central	Retail Other
N=9,995	N=1,910	N=3,047	N=4,368
Commercially harvest and sell saltwater products, but you can only sell to a licensed Florida wholesale dealer. Also covers fishing license.	Purchase saltwater products from SPL or other licensed WD and to sell saltwater products to WD, retail dealer or restaurant.	Sell saltwater products to end customer and can purchase products from a WD.	Sell saltwater products.



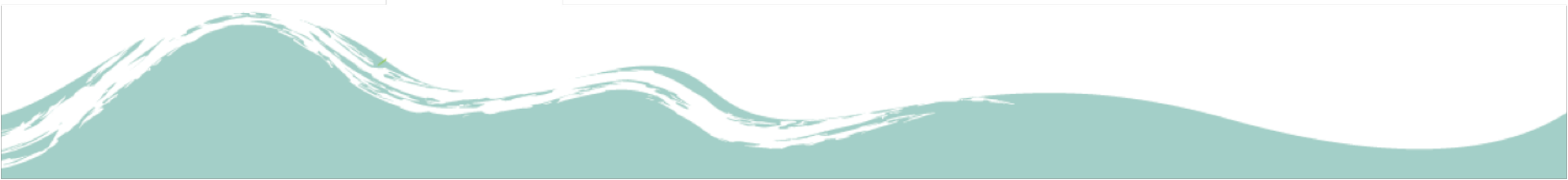
Survey design

Stratified sample 95% confidence, 5% error

	SPL	WD	RC	RO
	Saltwater Products License	Wholesale Dealer	Retail Central	Retail Other
	N=9,995	N=1,910	N=3,047	N=4,368
50/50 variability total sample = 1,385	n= 370	n=342	n=353	n=320
10/90 variability total sample = 535	n=137	n=133	n=135	n=130

variability = answer to primary question 'do you carry live bait' is 50 yes :50 no vs. 10:90

Total number surveys 753



Present demographics

Do you sell bait?

no

END

No

Current market

What kind?

Artificial, frozen, shrimp or FW fish only

Would you like to sell live marine fish if they were available?

Yes

What kind?

Further details on live baitfish market

Species?

Live fish

Price for each?
Is the price seasonal?

How often are they available?

Always

END

Not always

potential expansion

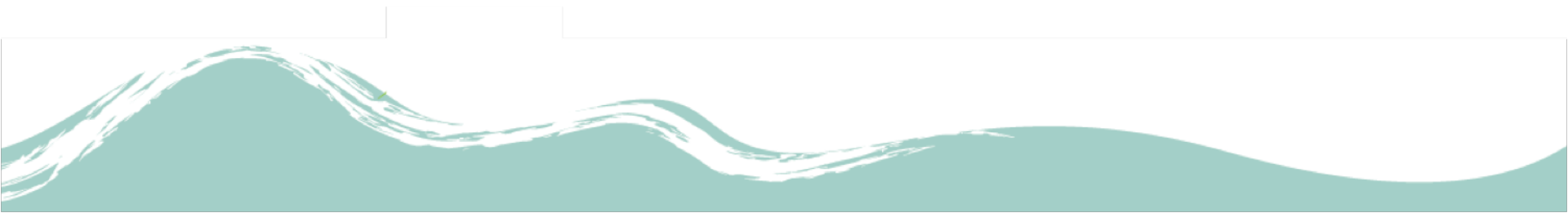
Any species of fish you would like to sell that you don't already?

could you sell more if they were available?

END

Results

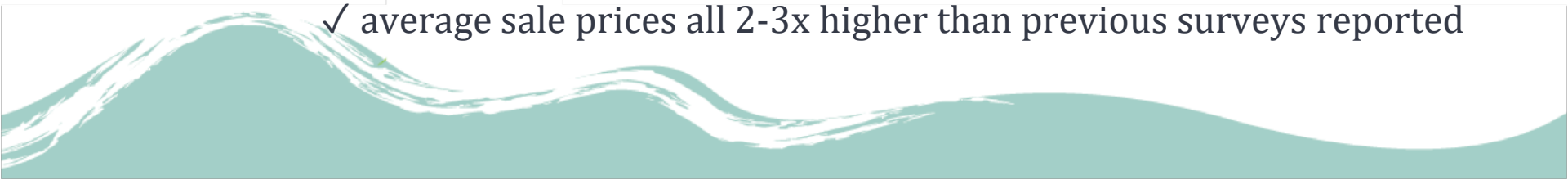
	SPL	WD	RC	RO
	Saltwater Products License	Wholesale Dealer	Retail Central	Retail Other
Who?	fisherman	bait shops and fishers	bait shops, fishers, aquarium stores, sports stores, fish markets	big box stores
Observed Variability	3:7	4:6	3:7	0:10
ranked common live bait sales	<ol style="list-style-type: none"> 1. shrimp 2. mullet 3. greenies 	<ol style="list-style-type: none"> 1. shrimp 2. pinfish 3. pilchards 4. threadfin 5. goggle-eye 6. minnows 	<ol style="list-style-type: none"> 1. Shrimp 2. pinfish, croaker and mullet 3. mudminnows & spinners 	NA if sold bait- frozen or artificial only



Results

	SPL	WD	RC	RO
	Saltwater Products License	Wholesale Dealer	Retail Central	Retail Other
Who?	fisherman	bait shops and fishers	bait shops, fishers, aquarium stores, sports stores, fish markets	big box stores
Observed Variability	3:7	4:6	3:7	0:10
ranked common live bait sales	1. shrimp 2. mullet 3. greenies	1. shrimp 2. pinfish 3. pilchards 4. threadfin 5. goggle-eye 6. minnows	1. Shrimp 2. pinfish, croaker and mullet 3. mudminnows & spinners	NA if sold bait- frozen or artificial only

- ✓ all said they could sell more live bait fish if had inventory
 - fish not available year round (seasonal)
 - inventory very weather dependent
 - many said fish hard to keep alive or come in in bad shape
- ✓ average sale prices highly variable
- ✓ average sale prices all 2-3x higher than previous surveys reported



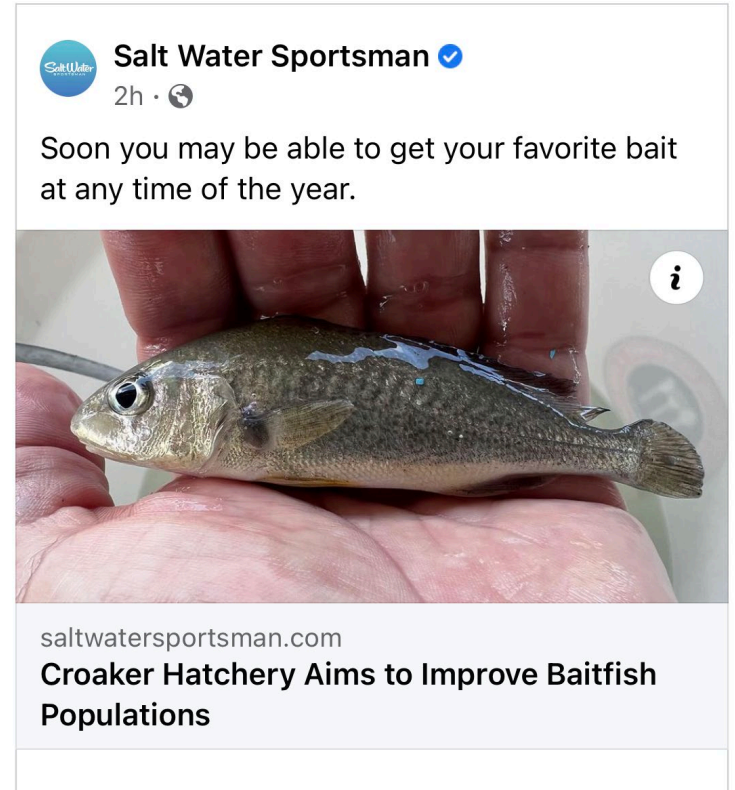
Research ROI to date

Economics

- ✓ 3 new farmers
- ✓ 5 new farmers in permitting
- ✓ over 40 calls from bait retailers begging for croaker product

Outreach and PR

- ✓ Salt water sportsman article
- ✓ 2 presentations at Aquaculture America
- ✓ soon... 2 peer-reviewed publications



Raising fish isn't just a job,
it's our passion.

Nicole Kirchhoff
info@liveadvantagebait.com
www.liveadvantagebait.com

It's that simple!



liveadvantagebait.com