# Production constraints and consumer demand in an emerging blue catfish (*Ictalurus furcatus*) fishery

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# Market & Fishery

- ~3M lb/yr blue catfish landed commercially in VA, ~2M lb/yr landed in Maryland
  - Chesapeake Bay landings make up ~40-50% existing wild-caught catfish market (~12M lb/yr)

- Sold in 8/19 VA seafood markets surveyed in 2021 (Hampton Roads, Richmond, DC metro; 17/19 aware of product)

- Expansion requires increased industry participation, improvements in consumer demand → NOAA SK project

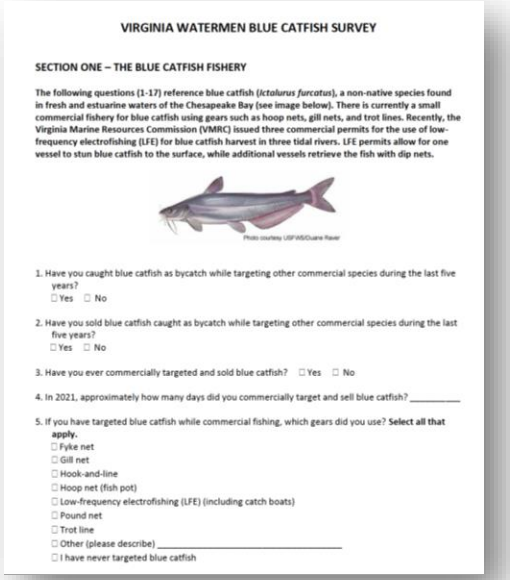
Pamela D'Angelo


Troy Tuckey

# Watermen

- Survey distributed to:
  - Individuals with previous landings (n=224)
  - Individuals with no landings but gears that could be used (n=288)
  - Individuals with no landings, without gears (n=288)

- Survey questions:
  - Past participation, barriers to increased targeting
  - Expected targeting at different price levels
  - Views/concerns on blue catfish
  - Fishing behavior, demographics



VIRGINIA WATERMEN BLUE CATFISH SURVEY

SECTION ONE – THE BLUE CATFISH FISHERY

**The following questions (1-17) reference blue catfish (*Ictalurus furcatus*), a non-native species found in fresh and estuarine waters of the Chesapeake Bay (see image below). There is currently a small commercial fishery for blue catfish using gears such as hoop nets, gill nets, and trot lines. Recently, the Virginia Marine Resources Commission (VMRC) issued three commercial permits for the use of low-frequency electrofishing (LFE) for blue catfish harvest in three tidal rivers. LFE permits allow for one vessel to stun blue catfish to the surface, while additional vessels retrieve the fish with dip nets.**

1. Have you caught blue catfish as bycatch while targeting other commercial species during the last five years?
   ☐ Yes ☐ No

2. Have you sold blue catfish caught as bycatch while targeting other commercial species during the last five years?
   ☐ Yes ☐ No

3. Have you ever commercially targeted and sold blue catfish? ☐ Yes ☐ No

4. In 2021, approximately how many days did you commercially target and sell blue catfish? _____

5. If you have targeted blue catfish while commercial fishing, which gears did you use? **Select all that apply.**
   ☐ Fyke net
   ☐ Gill net
   ☐ Hook-and-line
   ☐ Hoop net (fish pot)
   ☐ Low-frequency electrofishing (LFE) (including catch boats)
   ☐ Pound net
   ☐ Trot line
   ☐ Other (please describe) _____
   ☐ I have never targeted blue catfish

# Watermen – Survey Results

- 173 surveys returned (22.4% response); greater response from individuals who had landed blue catfish previously
- Individuals who had landed blue catfish:
  - Reported targeting blue catfish for 55.4 days in 2021 (sd=66.5)
  - Tended to be more diversified (gears used, species landed, sales)
  - Tended to be more concerned about ecological & fishery impacts of blue catfish and less concerned about use of LFE in commercial fishery
- 61.8% of all respondents reported blue catfish bycatch; 70.1% of those reporting bycatch had sold it
- Price noted as primary concern regarding expansion of fishery

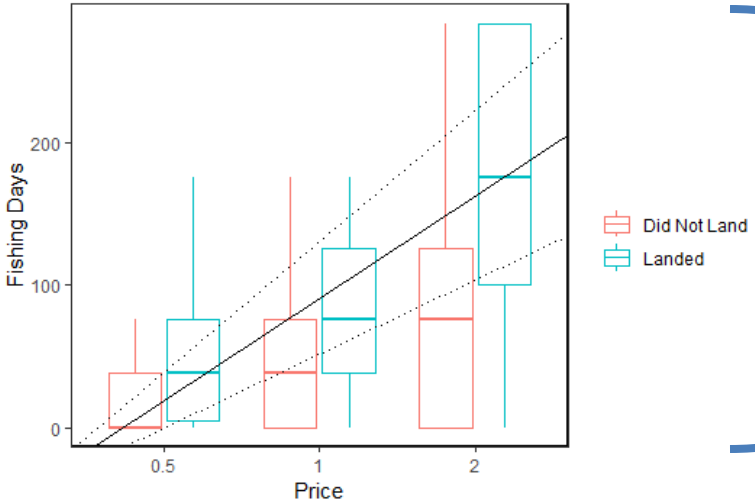
**Questions 15-17 refer to hypothetical blue catfish market scenarios. Even if you have never targeted blue catfish or did not target blue catfish in 2021, please answer the following questions as accurately as possible.**

15. How many days per year would you be willing to actively target blue catfish if the market price were between $0.30-$0.70/lb and blue catfish were available in the areas you typically fish?
    ☐ Less than 10 days ☐ 11-25 days ☐ 26-50 days ☐ 51-100 days ☐ 101-150 days
    ☐ 151-200 days ☐ More than 200 days ☐ None/I would not target

16. How many days per year would you be willing to actively target blue catfish if the market price were between $0.80-$1.20/lb and blue catfish were available in the areas you typically fish?
    ☐ Less than 10 days ☐ 11-25 days ☐ 26-50 days ☐ 51-100 days ☐ 101-150 days
    ☐ 151-200 days ☐ More than 200 days ☐ None/I would not target

17. How many days per year would you be willing to actively target blue catfish if the price you received were between $1.65-$1.75/lb and blue catfish were available in the areas you typically fish?
    ☐ Less than 10 days ☐ 11-25 days ☐ 26-50 days ☐ 51-100 days ☐ 101-150 days
    ☐ 151-200 days ☐ More than 200 days ☐ None/I would not target

# Watermen – Survey Results




- $0.50/lb increase in price would increase targeting by ~25 days/yr per person on average
- Those who had previously landed were more responsive to price increases
- Higher prices could incentivize those who have not previously targeted

# Processors

- Contacted 12 processors (11 VA, 1 NC) who had bought blue catfish 2017-2021 → 6 interviews conducted
- Interviews covered:
  - Business background
  - Involvement in blue catfish
  - Perspectives on seafood industry (generally and with respect to blue catfish)
- Interviews were recorded (with permission) and transcribed using otter.ai
  - Transcriptions used in a sentiment analysis to understand interviewee attitudes across interview themes

Jonathon Gruenke

# Processors – Interview Results

- General concerns
  - Availability of watermen (aging out, dying)
  - Availability of skilled labor (cutting)
- Blue catfish
  - Mixed opinions on USDA inspection; some see as low-cost and positive marketing
  - Steady or increasing demand noted, no issues in finding market
  - Product distributed throughout US East Coast, South, and Mid-West
  - Cost-competitive with farm-raised
- Statement sentiments mildly positive across themes (no statistical differences)
  - More variance/outliers in statement sentiments regarding outlook of blue catfish fishery (more uncertainty, potential optimism)

# Consumers

- Consumer preference survey developed and distributed using Qualtrics
  - Online panel (n =1,010) → individuals ≥18, live in Mid-Atlantic or Southeast US, consumed seafood at least once in last month
- Survey consisted of ~40 questions covering:
  - Demographics
  - Seafood purchasing and consumption behavior
  - Perceptions/preferences related to seafood production method (aquaculture vs. wild harvest)
  - Catfish consumption patterns and preferences
  - Stated preference choice experiment

Elise Bauer

# Consumers – Choice Experiment

Each survey included a choice experiment where individuals were presented information on seafood products, including a price, and asked to choose the option they most preferred

CHOICE SCENARIO

| | Option A | Option B | Option C |
|---|---|---|---|
| |  |  | |
| Species Name | Blue Catfish | Channel Catfish | Do not purchase |
| Production Method | Wild-Caught | Farm-Raised | |
| Origin | United States | Mississippi | |
| Price per Pound ($) | $14.11 | $14.11 | |

CHOICE SCENARIO

| | Option A | Option B | Option C |
|---|---|---|---|
| |  |  | |
| Species Name | Red Snapper | Blue Catfish | Do not purchase |
| Production Method | Not Available | Not Available | |
| Origin | Not Available | Not Available | |
| Price per Pound ($) | $18.34 | $7.60 | |

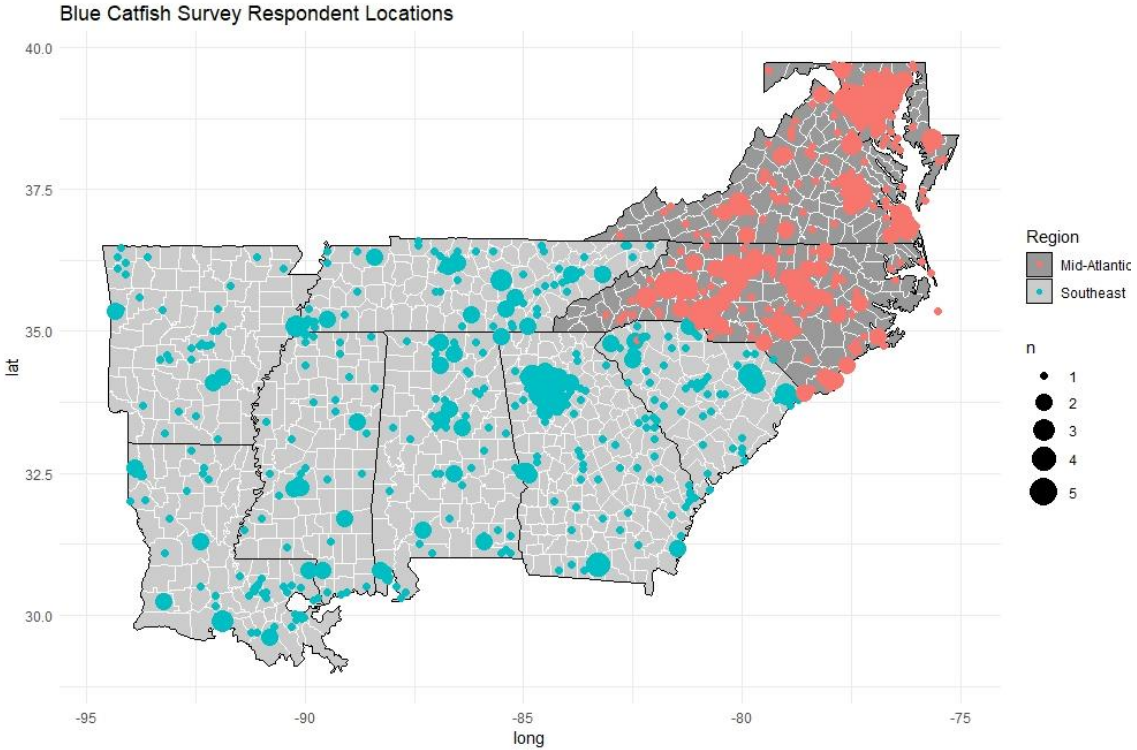
CHOICE SCENARIO

| | Option A | Option B | Option C |
|---|---|---|---|
| |  |  | |
| Species Name | Tilapia | Flounder | Do not purchase |
| Production Method | Not Available | Wild-Caught | |
| Origin | Florida | Not Available | |
| Price per Pound ($) | $5.32 | $14.11 | |

# Consumers – Choice Experiment

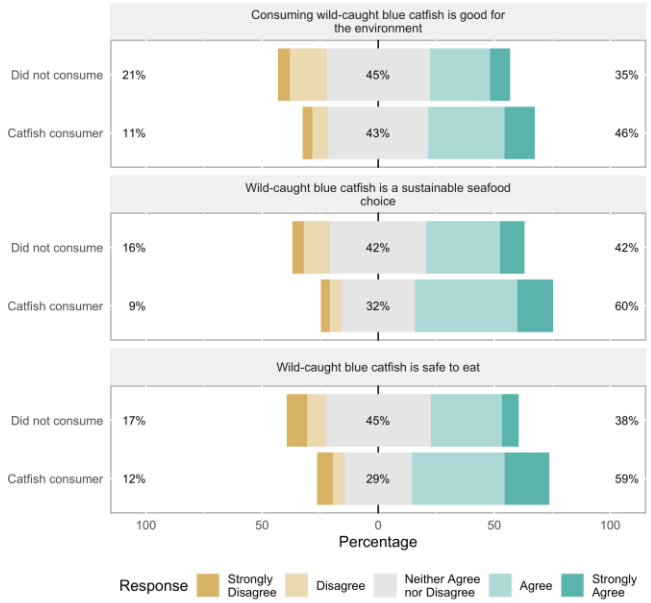
| Treatment Group Number | Information Provided |
|---|---|
| 1 | None |
| 2 | Blue catfish are silvery blue in appearance with a smooth body. They are less than two feet in length on average but can grow up to five feet. Blue catfish can be fried, pan seared, grilled, or baked. |
| 3 | Like other large fish species, blue catfish accumulate contaminants such as PCBs and mercury. Recent studies have found that contaminant levels in blue catfish are lower than levels deemed safe by U.S. federal agencies however. |
| 4 | Blue catfish are an invasive species found in several rivers of the Chesapeake Bay and whose range is expanding. Blue catfish can consume 10% of their body weight per day, and eat important native species such as blue crab and menhaden. Blue catfish from the Chesapeake Bay is listed as a "Best Choice" on the Monterey Bay Aquarium's Seafood Watch list. |
| 5 | Blue catfish are an invasive species found in several rivers of the Chesapeake Bay and whose range is expanding. Blue catfish can consume 10% of their body weight per day, and eat important native species such as blue crab and menhaden. Blue catfish from the Chesapeake Bay is listed as a "Best Choice" on the Monterey Bay Aquarium's Seafood Watch list.<br><br>Like other large fish species, blue catfish accumulate contaminants such as PCBs and mercury. Recent studies have found that contaminant levels in blue catfish are lower than levels deemed safe by U.S. federal agencies however. |
| 6 | No picture provided |

Present different information about blue catfish and test if it influences decisions


Blue Catfish Survey Respondent Locations
40.0
37.5
35.0
32.5
30.0
lat
-95
-90
-85
-80
-75
long
Region
Mid-Atlantic
Southeast
n
1
2
3
4
5

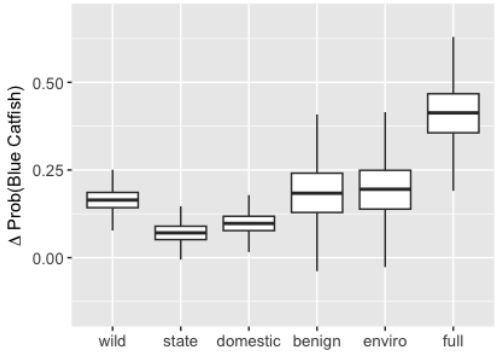
# Consumers – Survey Results

- Catfish was the fourth most poplar species consumed (after shrimp, salmon, crab)
  - 67% report consuming catfish within the last year
- 33% had previously consumed wild-caught blue catfish, 35% had not but would be willing to try it
- Catfish consumers had more positive views towards blue catfish consumption



# Consumers – Choice Experiment Results

| Species/Product | WTP (2022 US$) |
|---|---|
| Blue catfish | **13.91** [9.12, 18.74] |
| Channel catfish | **11.61** [8.16, 14.80] |
| Flounder | **18.22** [15.64, 21.08] |
| Red snapper | **16.76** [13.22, 19.57] |
| Tilapia | **17.93** [14.63, 21.61] |




- Willingness-to-pay highest for flounder, lowest for channel catfish
- Consumers valued information on product origin, production method
  - Wild-caught and farm-raised valued similarly
- Blue catfish information that was positive (or benign) increased WTP
- Mid-Atlantic consumers had lower WTP for blue catfish

# Conclusions – Market Potential

- Price can incentivize increased targeting
  - Those who do not currently target may consider it if price increased
  - Meat yields are low (20-25%), making it difficult to support high ex-vessel prices, e.g., $2/lb ex-vessel would mean $10/lb processed (without any markup)
- Processing sector needs man-power, capital to expand
- Large potential consumer base in US Southeast
  - Wild-caught catfish is ~2% farm-raised market
  - Many consumers open to trying blue catfish
  - Blue catfish may outcompete farm-raised catfish → product marketing should improve WTP, increase consumer familiarity


NOAA FISHERIES

Saltonstall-Kennedy Grant Competition
Grant # NA21NMF4270325

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