

Introduction

Welcome to the Virginia Middle Peninsula Recreational Angling Survey! This survey contains approximately 25 questions and is expected to take 15 minutes to complete. Your responses will help inform fishery and coastal managers about recreational angling in the region and the economic importance of coastal habitats.

You were invited to participate in this survey because you were licensed or registered to fish recreationally in Virginia tidal waters during 2021 and had a mailing address in or near the Middle Peninsula. Participation in this research is voluntary and you are free to withdraw at any time without penalty. You must be at least 18 years of age to participate. Your individual responses are considered confidential information and will not be shared publicly. All responses will be anonymized at the conclusion of the survey. Survey

results will be shared through publications and presentations to stakeholders and the public.

This research is funded by the Chesapeake Bay Office of the National Oceanic and Atmospheric Administration. If you have any questions or concerns regarding participation in this research, please contact Dr. Andrew M. Scheld at the Virginia Institute of Marine Science by email (scheld@vims.edu) or telephone (804-684-7160).

You may report dissatisfaction with any aspect of this study to Dr. Jennifer A. Stevens, Ph.D., Chair of the Protection of Human Subjects Committee by email (jastev@wm.edu) or telephone (757-221-3862).

By continuing to the survey, you indicate that you agree to participate in this voluntary study and have read the information provided above.

Thank you for your time and participation!

Principal Investigators:

Dr. Andrew M. Scheld, Associate Professor, Virginia Institute of Marine Science

Dr. Donna M. Bilkovic, Research Professor, Virginia Institute of Marine Science

Susanna Musick, Marine Recreational Specialist, Virginia Institute of Marine Science

THIS PROJECT WAS APPROVED BY WILLIAM & MARY PROTECTION OF HUMAN SUBJECTS COMMITTEE (Phone: 757-221-3966) ON 2022-04-01.

Recent fishing

In 2021, approximately how many recreational fishing trips did you take in Virginia tidal waters (inshore waters to three miles offshore)? (Please enter the total number of trips)



Fishing questions

When recreationally fishing in Virginia tidal waters, what is your primary fishing mode?

- O Charter or party boat
- Pier, jetty, bridge or dock
- Private motorized boat

| Private non-motorized boat (e.g., kayak) |
|---|
| Shore (beach, marsh, riprap revetment or seawall) |
| Other (please describe) |
| |
| |
| |
| In 2021, which species did you target when recreationally fishing |
| in Virginia tidal waters? (Select all that apply) |
| Black drum |
| Bluefish |
| Catfish (blue, channel, flathead) |
| Cobia |
| Croaker/spot |
| Kingfish (sea mullet, roundhead) |
| ☐ King/Spanish mackerel |
| Red drum |
| Sheepshead |
| Spadefish |
| Summer flounder |
| Spotted seatrout (speckled trout) |
| Striped bass |
| Tautog |
| Whatever bites |
| Other (please describe) |

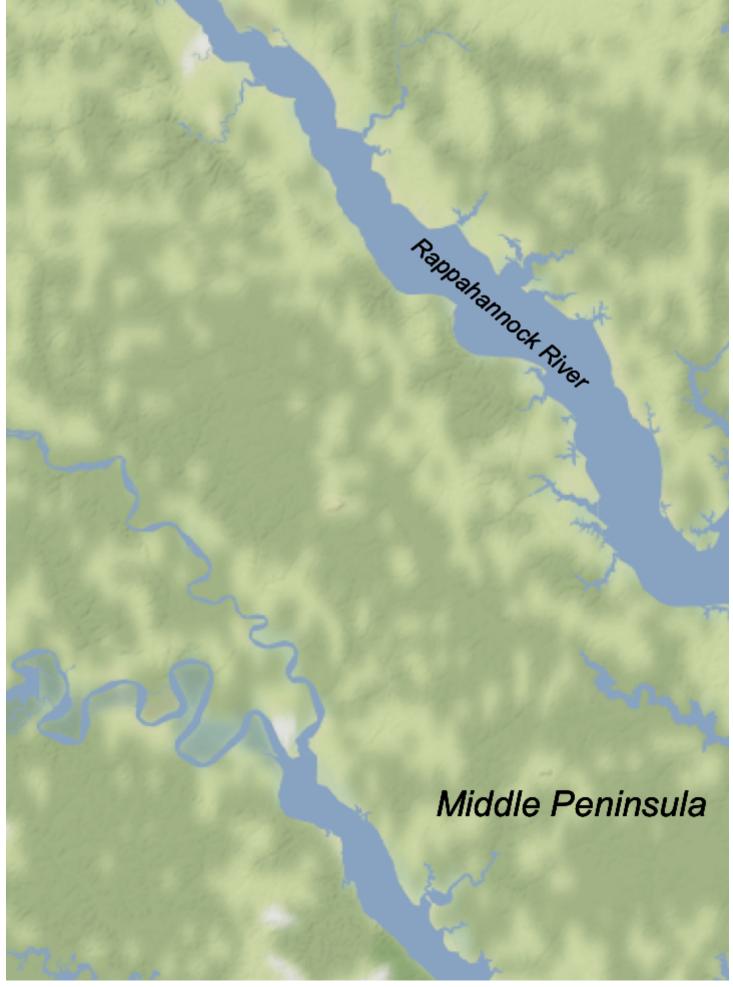
Qualtrics Survey Software

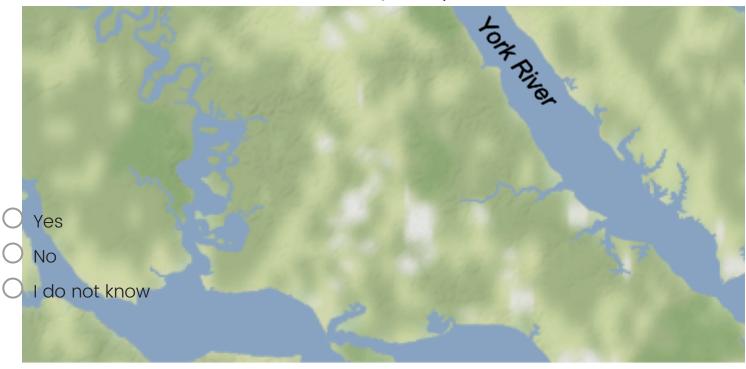
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In 2021, what locations did you visit when recreationally fishing in Virginia tidal waters? (Select all that apply)

| Atlantic Ocean |
|------------------------------------|
| Chesapeake Bay - Mainstem |
| Chesapeake Bay - Mouth |
| Eastern Shore - Bayside |
| Eastern Shore - Seaside Bays |
| James River and tributaries |
| Mobjack Bay and tributaries |
| Piankatank River |
| Potomac River and tributaries |
| Rappahannock River and tributaries |
| York River and tributaries |
| Other (please describe) |
| |

Please mark on the map the fishing location you visit most frequently when recreational fishing in tidal waters around the Middle Peninsula of Virginia. If you visit multiple locations with a similar frequency, please mark your most recent fishing location. (As a reminder, only aggregated data collected through this survey will be shared; individual responses will not be disclosed under any circumstances.)





Bait

In 2021, which species did you catch for use as bait when recreationally fishing in Virginia tidal waters? (Select all that apply)

- I did not catch my own bait
- Crabs (e.g., fiddler crabs, blue crabs)
- Croaker/spot
- Eel
- Finger mullet
- Grass shrimp
- Menhaden
- Minnows (e.g., mummichogs, killifish, sheepshead minnows)
- Pinfish

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|--------------------------------------|-------------------------|
| | Other (please describe) |

In 2021, which types of habitats did you visit to catch bait for use when recreationally fishing in Virginia tidal waters? (Select all that apply)

| I did not catch my own bait |
|---|
| Beach or sandy shoreline |
| Man-made bottom structure (artificial reef, bridge or pier pile) |
| Man-made shoreline structure (bulkhead, rock or riprap revetment seawall) |
| Marsh or living shoreline |
| Open water |
| Oyster reef or other natural hard bottom |
| Seagrass bed |
| Other (please describe) |
| |

Habitat questions

In 2021, which types of habitats did you visit to catch target species when recreationally fishing in Virginia tidal waters? (Select all that apply)

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|--------------------------------|---|
| ☐ Beach or sandy s | shoreline |
| ☐ Man-made botto | om structure (artificial reef, bridge or pier pile) |
| ☐ Man-made shore seawall) | eline structure (bulkhead, rock or riprap revetment, |
| ☐ Marsh or living sh | noreline |
| Open water | |
| Oyster reef or oth | ner natural hard bottom |
| ☐ Seagrass bed | |
| | Other (please describe) |
| in supporting waters, ackno | te how important you feel each habitat type is healthy recreational fisheries in Virginia tidal wledging that even if you do not visit or a particular type of habitat it may still be |

Man-made bottom structure (artificial reef, bridge or pier pile) Man-made shoreline structure (bulkhead, rock or riprap revetment, seawall) Marsh or living shoreline Open water Oyster reef or other natural hard bottom

important in supporting recreational species.

Beach or sandy shoreline

Seagrass bed



For those habitats you felt were "Extremely important" or "Very important" in supporting healthy recreational fisheries in Virginia tidal waters, what beneficial functions do you feel these habitats provide for recreational fish species? (Select all that apply)

| | Other (please describe) |
|---|---------------------------|
| | I do not know |
| | Spawning/breeding areas |
| | Protection from predators |
| Ш | Access to food/forage |



A living shoreline is a pile (sill) of rocks, oyster bags, oyster reef structures, or fiber logs placed in front of an existing or planted marsh to protect and stabilize the coastal edge. Living shorelines in the Middle Peninsula have been found to provide habitat for a variety of wildlife, including several species of fish.

Please indicate how you view living shorelines as compared to natural marshes in supporting healthy recreational fisheries in Virginia tidal waters.

- I view living shorelines as similar or identical to natural marshes
- I view living shorelines as superior to natural marshes
- I view living shorelines as inferior to natural marshes

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|-------------------|---------------------------|
| O I do not know | |
| | Other (please describe) |

Travel 1

You indicated that you visited **beach or sandy shoreline habitats** when recreationally fishing in Virginia tidal waters for target or bait species. The next several questions pertain to your recreational fishing activities at these locations.

In 2021, approximately how many recreational fishing trips did you take to beach or sandy shoreline habitats for the purpose of catching target or bait species? (Please enter the total number of trips)



Approximately how long does it take you to travel to beach or sandy shoreline habitats where you recreationally fish for target or bait species when traveling from your residence?

Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to beach or sandy shoreline habitats directly from your residence, please leave the fields below blank.

| One-way travel time on land (minutes) | |
|--|--|
| One-way travel time on water (minutes) | |

In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at beach or sandy shoreline habitats in Virginia tidal waters? Include all trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)

| ~ |
|---|
|---|

Travel 2

You indicated that visited man-made bottom structure **habitats** (artificial reef, bridge or pier pile) when recreationally fishing in Virginia tidal waters for target or bait species. The next several questions pertain to your recreational fishing activities at these locations.

In 2021, approximately how many recreational fishing trips did you take to man-made bottom structure habitats for the purpose of catching target or bait species? (Please enter the total number of trips)



Approximately how long does it take you to travel to manmade bottom structure habitats where you recreationally fish for target or bait species when traveling from your residence? Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to man-made bottom structure habitats directly from your residence, please leave the fields below blank.

| One-way travel time on land (minutes) | |
|--|--|
| One-way travel time on water (minutes) | |

In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at manmade bottom structure habitats in Virginia tidal waters? Include all trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)

| | ~ |
|--|---|
|--|---|

Travel 3

You indicated that you visited **man-made shoreline** structure habitats (bulkhead, rock or riprap revetment, seawall) when recreationally fishing in Virginia tidal waters for target or bait species. The next several questions pertain to your recreational fishing activities at these locations.

(minutes)

| In 2021, approximately how many recreational fishing trips did you take to <u>man-made shoreline structure habitats</u> for the purpose of catching target or bait species? (Please enter the total number of trips) |
|---|
| |
| Approximately how long does it take you to travel to man-made shoreline structure habitats where you recreationally fish for target or bait species when traveling from your residence? Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to man-made shoreline structure habitats directly from your residence, please leave the fields below blank. |
| One-way travel time on land (minutes) |
| One-way travel time on water |

In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at manmade shoreline structure habitats in Virginia tidal waters? Include all trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)



Travel 4

You indicated that you visited marsh or living shoreline **habitats** when recreationally fishing in Virginia tidal waters for target or bait species. The next several questions pertain to your recreational fishing activities at these locations.

In 2021, approximately how many recreational fishing trips did you take to marsh or living shoreline habitats for the purpose of catching target or bait species? (Please enter the total number of trips)

Approximately how long does it take you to travel to <u>marsh</u> <u>or living shoreline habitats</u> where you recreationally fish for target or bait species when traveling from your residence? Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to marsh or living shoreline habitats directly from your residence, please leave the fields below blank.

| One-way travel time on land (minutes) | |
|--|--|
| | |
| One-way travel time on water (minutes) | |

In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at <u>marsh</u> or <u>living shoreline habitats</u> in Virginia tidal waters? Include all trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)

Travel 5

You indicated that you visited **open water habitats** when recreationally fishing in Virginia tidal waters for target or bait species. The next several questions pertain to your recreational fishing activities at these locations.

In 2021, approximately how many recreational fishing trips did you take to open water habitats for the purpose of catching target or bait species? (Please enter the total number of trips)



Approximately how long does it take you to travel to open water habitats where you recreationally fish for target or bait species when traveling from your residence? Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to open

water habitats directly from your residence, please leave the fields below blank.

| One-way travel time on land (minutes) | |
|--|--|
| | |
| One-way travel time on water (minutes) | |

In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at open water habitats in Virginia tidal waters? Include all trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)

Travel 6

You indicated that you visited oyster reef or other natural hard bottom habitats when recreationally fishing in Virginia tidal waters for target or bait species. The next

several questions pertain to your recreational fishing activities at these locations.

In 2021, approximately how many recreational fishing trips did you take to oyster reef or other natural hard bottom habitats for the purpose of catching target or bait species? (Please enter the total number of trips)

Approximately how long does it take you to travel to oyster reef or other natural hard bottom habitats where you recreationally fish for target or bait species when traveling from your residence? Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to oyster reef or other natural hard bottom habitats directly from your residence, please leave the fields below blank.

One-way travel time on land (minutes)

One-way travel time on water (minutes)



In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at oyster reef or other natural hard bottom habitats in Virginia tidal waters? Include all trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)

| | ~ | |
|--|----------|--|
|--|----------|--|

Travel 7

You indicated that you visited **seagrass bed habitats** when recreationally fishing in Virginia tidal waters for target or bait species. The next several questions pertain to your recreational fishing activities at these locations.

(minutes)

| In 2021, approximately how many recreational fishing trips did you take to <u>seagrass bed habitats</u> for the purpose of catching target or bait species? (Please enter the total number of trips) |
|---|
| |
| Approximately how long does it take you to travel to seagrass bed habitats where you recreationally fish for target or bait species when traveling from your residence? Please indicate separately average one-way travel times for travel on land and on water. If you typically do not travel to seagrass bed habitats directly from your residence, please leave the fields below blank. |
| One-way travel time on land (minutes) |
| One-way travel time on water |

In 2021, how much did you typically spend per fishing trip on trip-related expenses when recreationally fishing at seagrass bed habitats in Virginia tidal waters? Include all

trip expenses such as bait, chum, ice, fuel, food and drinks, lodging, and charter or guide fees. (If you typically split trip costs, indicate only your personal share of expenses)



DCE description

This section of the survey presents two hypothetical recreational fishing trip choice scenarios. Each scenario includes two trip options (Option A and Option B) that may differ in terms of the shoreline habitat visited, total travel time to reach the fishing site, and trip costs. A third no-trip option (Option C) is also presented to provide an alternative if neither fishing trip is desirable.

Trip costs include all direct expenses associated with a recreational fishing trip, such as fuel for your vehicle or boat, food and drinks, ice, and bait. Total travel time captures the amount of time in minutes it would take you to reach the fishing site when traveling from your residence, including both travel time on land and on the water.

For each recreational fishing trip option, assume you would use fishing gear, methods, and site access modes that you typically use, go during the season you would typically fish, and target species you typically target. In each choice scenario, you will be asked to choose the option you most prefer. Please do not compare options presented across different choice scenarios.

DCE - low cost A

CHOICE SCENARIO

| | Option A | Option B | Option C |
|-------------------|--------------------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Marsh / Living shoreline | Bulkhead | |
| Total travel time | 30 minutes | 15 minutes | |
| Trip cost to you | \$17 | \$24 | |

Choose your most preferred option from the list below:

Option A

- Option B
- Option C

| | Option A | Option B | Option C |
|-------------------|------------------|--------------------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Riprap revetment | Marsh / Living shoreline | |
| Total travel time | 45 minutes | 45 minutes | |
| Trip cost to you | \$10 | \$24 | |

Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - low cost B

| | Option A | Option B | Option C |
|-------------------|------------|--------------------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Beach | Marsh / Living shoreline | |
| Total travel time | 30 minutes | 15 minutes | |
| Trip cost to you | \$17 | \$10 | |

Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

| | Option A | Option B | Option C |
|-------------------|------------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Riprap revetment | Bulkhead | |
| Total travel time | 30 minutes | 15 minutes | |
| Trip cost to you | \$24 | \$10 | |

Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - low cost C

| | Option A | Option B | Option C |
|-------------------|------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Beach | Bulkhead | |
| Total travel time | 15 minutes | 30 minutes | |
| Trip cost to you | \$10 | \$17 | |

Choose your most preferred option from the list below:

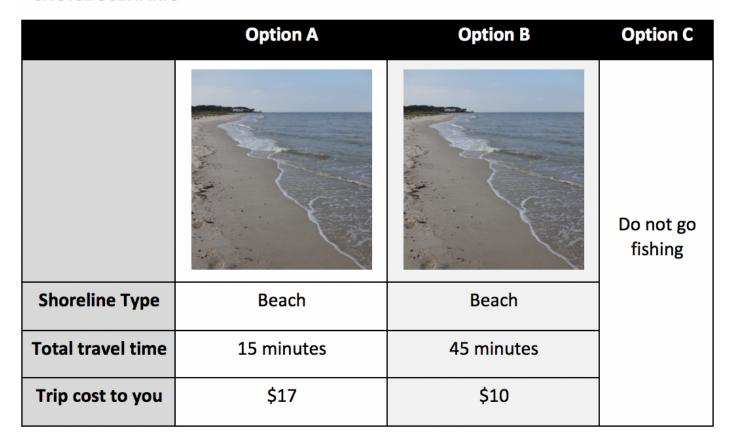
- Option A
- Option B
- Option C



Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - low cost D



Choose your most preferred option from the list below:

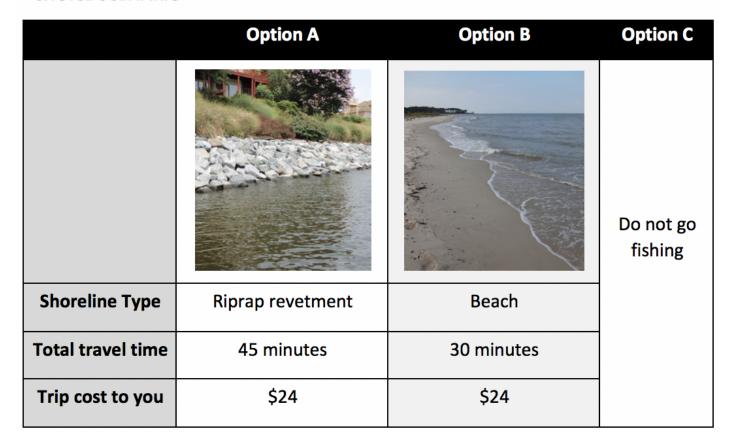
- Option A
- Option B
- Option C



Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - low cost E



Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

| | Option A | Option B | Option C |
|-------------------|------------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Riprap revetment | Bulkhead | |
| Total travel time | 30 minutes | 45 minutes | |
| Trip cost to you | \$10 | \$17 | |

Choose your most preferred option from the list below:

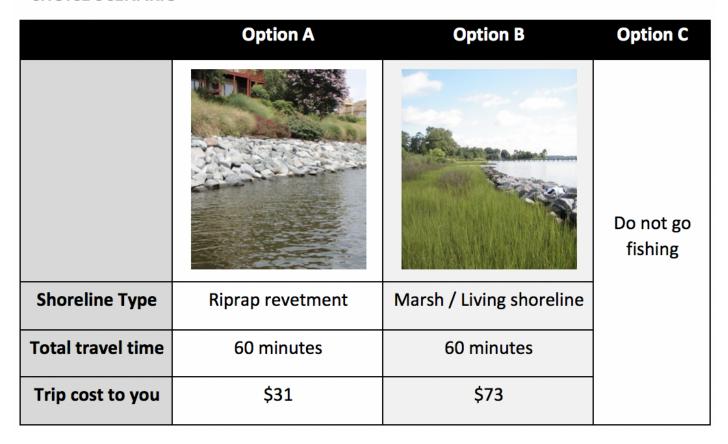
- Option A
- Option B
- Option C

DCE - high cost A

| | Option A | Option B | Option C |
|-------------------|--------------------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Marsh / Living shoreline | Bulkhead | |
| Total travel time | 45 minutes | 30 minutes | |
| Trip cost to you | \$52 | \$73 | |

Choose your most preferred option from the list below:

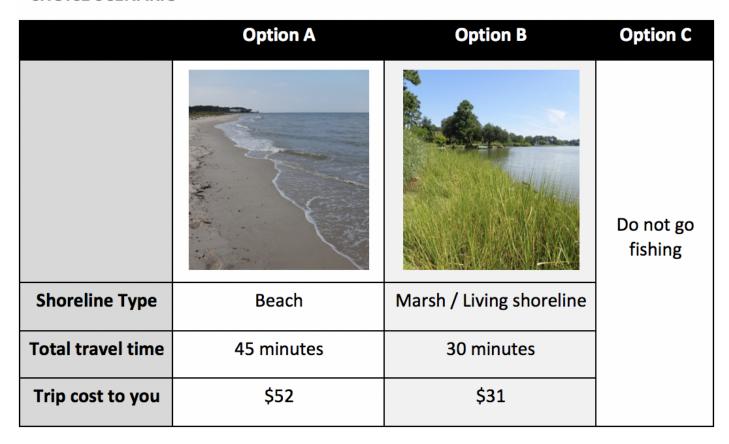
- Option A
- Option B
- Option C



Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - high cost B



- Option A
- Option B
- Option C

| | Option A | Option B | Option C |
|-------------------|------------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Riprap revetment | Bulkhead | |
| Total travel time | 45 minutes | 30 minutes | |
| Trip cost to you | \$73 | \$31 | |

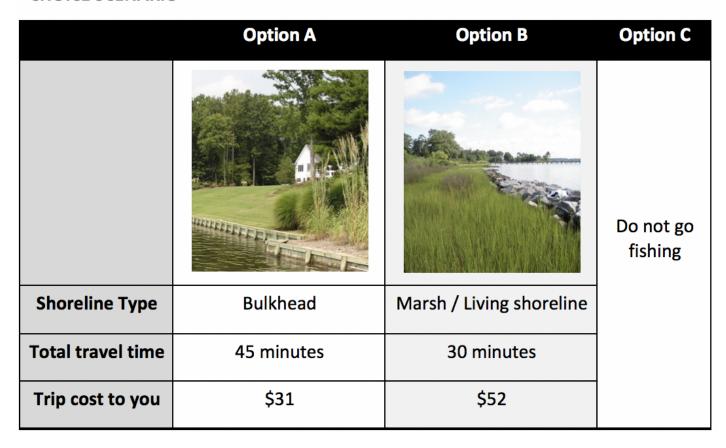
Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - high cost C

| | Option A | Option B | Option C |
|-------------------|------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Beach | Bulkhead | |
| Total travel time | 30 minutes | 45 minutes | |
| Trip cost to you | \$31 | \$52 | |

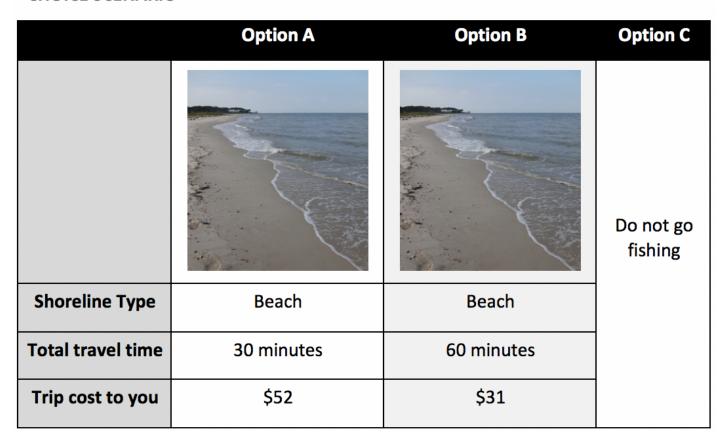
- Option A
- Option B
- Option C



Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - high cost D



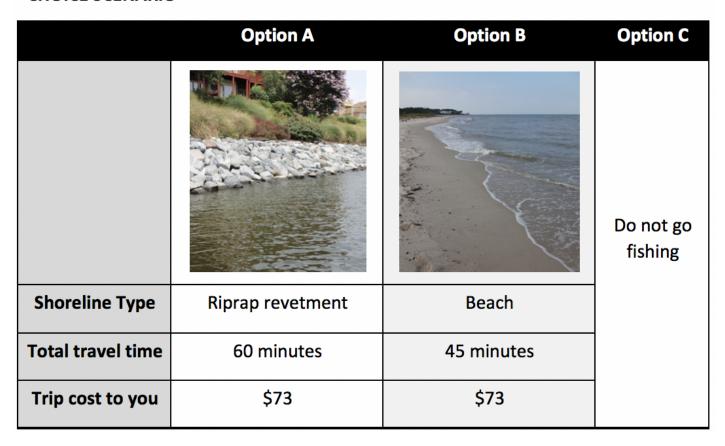
- Option A
- Option B
- Option C

| | Option A | Option B | Option C |
|-------------------|------------------|--------------------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Riprap revetment | Marsh / Living shoreline | |
| Total travel time | 30 minutes | 45 minutes | |
| Trip cost to you | \$52 | \$31 | |

Choose your most preferred option from the list below:

- Option A
- Option B
- Option C

DCE - high cost E



- Option A
- Option B
- Option C

| | Option A | Option B | Option C |
|-------------------|------------------|------------|----------------------|
| | | | Do not go fishing |
| Shoreline Type | Riprap revetment | Bulkhead | |
| Total travel time | 45 minutes | 60 minutes | |
| Trip cost to you | \$31 | \$52 | |

Choose your most preferred option from the list below:

| ntid | าก | Δ |
|------|------|-------|
| | ntid | ption |

- Option B
- Option C

Demographics

Please indicate which statements best describe your responses in the previous hypothetical recreational fishing trip choice scenarios. (Select all that apply)

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|--|---|
| ☐ I chose trips whe | re I thought I would catch the most fish |
| ☐ I chose trips whe | re I thought I would catch the biggest fish |
| ☐ I chose trips whe | re I thought I would catch species I usually target |
| ☐ I chose trips with | the lowest cost |
| ☐ I chose trips with | the lowest travel time |
| ☐ I chose trips to he | abitats I find aesthetically pleasing |
| ☐ I chose trips to he | abitats I can easily access |
| ☐ I do not know wh | y I chose the trips I did |
| | Other (please describe) |
| | |
| | |
| | |
| | |
| | |
| How many ye | ars have you recreationally fished in Virginia |
| How many ye tidal waters? | ars have you recreationally fished in Virginia |
| , , | ars have you recreationally fished in Virginia |
| , , | ears have you recreationally fished in Virginia |
| , , | ears have you recreationally fished in Virginia |
| , , | ears have you recreationally fished in Virginia |
| tidal waters? | |
| tidal waters? What are the p | rimary reasons you fish recreationally? (Select all |
| tidal waters? | |
| tidal waters? What are the p | rimary reasons you fish recreationally? (Select all |
| tidal waters? What are the p that apply) Challenge/thrill of | rimary reasons you fish recreationally? (Select all |
| tidal waters? What are the p that apply) Challenge/thrill of Get to experience | rimary reasons you fish recreationally? (Select all |
| tidal waters? What are the p that apply) Challenge/thrill of Get to experience | rimary reasons you fish recreationally? (Select all of catching fish e nature/be outdoors of fish for consumption |
| tidal waters? What are the p that apply) Challenge/thrill of Get to experience Harvest fish/keep Relaxing/tempor | rimary reasons you fish recreationally? (Select all of catching fish e nature/be outdoors of fish for consumption |

Other (please describe)

How would you rate yourself in terms of angling ability?

Beginner

Intermediate

Advanced

Expert

I do not fish recreationally

Are you a member of any recreational fishing clubs or interest groups (e.g., Coastal Conservation Association, American Sportfishing Association, American Saltwater Guides Association, VA Saltwater Sportfishing Association)?

) Yes

No

Not sure

What year were you born? (YYYY)

What is your gender?

Male

Female

Non-binary/non-conforming

Prefer not to respond

What is the highest level of school you have completed or the highest degree you have received?

Less than high school degree

High school graduate (high school diploma or equivalent including GED)

Some college but no degree

Associate degree in college (2-year)

Bachelor's degree in college (4-year)

Master's degree

Doctoral degree

Professional degree (e.g., JD, MD)

What category best describes your annual household income

before taxes?

- Less than \$25,000
- \$25,000 \$49,999
- \$50,000 \$74,999
- \$75,000 \$99,999
- \$100,000 \$124,999
- \$125,000 \$149,999
- \$150,000 \$174,999
- \$175,000 \$199,999
- \$200,000 or more
- Refuse to answer

Which of the following best describes you? (Select one)

- Asian or Pacific Islander
- Black or African American
- Hispanic or Latino
- Native American or Alaskan Native
- White or Caucasian
- Multiracial or Biracial
- A race/ethnicity not listed here

What is your home ZIP Code?

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