



## Mid-Atlantic Fishery Management Council

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# MEMORANDUM

**Date:** March 31, 2023  
**To:** Chris Moore  
**From:** Jason Didden  
**Subject:** Ocean City Video Boat Count Results

This project was designed to A) pilot test whether a video review of boat traffic through the Ocean City, Maryland inlet could be feasible for estimating Maryland's private boat ocean fishing effort (given all of Maryland's ocean fishing effort transits this one inlet) and B) compare any preliminary results from this pilot testing with the effort estimates from the Marine Recreational Information Program (MRIP).

### Summary Conclusions

#### A – Feasibility of using video to estimate Maryland's private boat ocean fishing effort

A video-based system in this particular location would require additional research and development before any resulting estimates could potentially pass a typical peer review used for fishery science. The video approach in this location has its own particular uncertainties, just as the Marine Recreational Information Program (MRIP) has uncertainties. These uncertainties would need to be examined in detail before one could have a high degree of confidence in any point estimate generated by a video-based effort estimate for this location.

#### B – Comparisons with MRIP

The ranges of effort suggested by this project overlapped with the confidence intervals from the relevant MRIP effort estimates, so this project did not indicate there is necessarily any inherent methodological problem with MRIP in this location. If more precision on Maryland private boat ocean effort was desired, higher sampling levels or specialized surveys would be needed. This is not a new concept, but appears reinforced by the results.

These conclusions are based on “1” How this project estimated effort, “2” How MRIP estimates effort, and “3” a comparison of the effort estimates from this project and MRIP. “1, 2, and 3” are detailed below.

## 1. Estimating Effort in this Video Project

### 1a. Counting Periods

This project counted boats of several types going through the Ocean City, Maryland inlet and then considered ranges of chance that those boats fished in the ocean and ranges of numbers of people fishing on those boats.

The Ocean City Life-Saving Station Museum allowed use of their tower (and power) for mounting the camera and housing equipment. COVID-19 delayed installation of the camera system until July 5, 2020 (so July 6, 2020 was the first full day). It was evident that there was sufficient light from the inlet parking lot and/or lights on vessels to reasonably discern night passage. Periods of fog were minimal – staff either borrowed nearby day data or expanded the same days count depending on the amount of time missed on a case by case basis. Recording continued into 2021 with the intent of obtaining a full calendar year of recording. Unfortunately the camera suffered damage from water intrusion and ceased operation on March 3, 2021. While replaced under warranty, troubleshooting, supply issues, and refurbishment of the lifesaving tower delayed deployment of a new camera until August 4, 2021. Recording continued until April 26, 2022, when the recorder was retrieved. Staff had planned to download videos remotely, but connection issues corrupted all but very short video downloads despite a hardline connection to the recording system. Staff periodically exchanged 6-8 terabyte hard drives as they filled. Due to a proprietary recording format, the recorder was retrieved in April 2022 so that the videos could be reviewed using the recorder itself, but even that was more challenging than anticipated. It was the intent to use a contractor to review the video. However, the tech issues with duplicating the files led to a timing issue for the contractor and meant that files had to be loaded and viewed in 1-hour blocks, greatly slowing down the pace of review. In the end, Council staff (Jason Didden) reviewed/counted all the video considered in this memo – there were a few days of overlap with the contractor and those are discussed below.

This timing means that there was good overlap with the following time periods and they were the focus of review and MRIP comparisons: July-December 2020 (Waves 4,5,6) and September-December 2021 (Waves 5-6). Viewing was mostly done at 40X or 20X normal speed depending on how busy the inlet was. This corresponded to 64X or 32X settings on the recorder, but when staff timed the reviewing, the actual speed was closer to 40X or 20X. This means that any day could take up to 1.5 hours to review, though as discussed below, days with lower effort may have unobserved periods and/or could be reviewed faster, so the review times for a day were generally 0.5-1.0 hours. There is likely to be a range of speeds that any reviewer feels comfortable making a reasonable count of vessels, and staff believes it is likely that some people would review at substantially slower speeds (and take substantially longer to review). Staff did not track project time exactly given the reviewing was done piecemeal amongst other tasks, but a busy summer month probably took around 40 hours to review while a December month took around 20 hours (when recording and organizing data is included).

It was unfortunate that the camera system was not set up leading into the July 4<sup>th</sup> 2020 weekend starting wave 4, but staff noted that wave heights were consistently low that week (hourly wave height at the weather buoy 19 miles off the MD/DE border for July 1-5 2020 averaged 2.4 feet with no observations over 3.0 feet), and the weather was seasonal except for thunderstorms July 1 (Salisbury, MD Airport). Winds at the ferry dock in Lewes, DE were also seasonally calm, generally below 10 knots. Considering the weather and the holiday week, it seems reasonable to

expect high participation for July 1-5, except for July 1 given thunderstorms were in the area. If the lowest Wednesday counts are used for July 1, and the highest other matching July day of week counts are used for July 2 (Thursday), July 3 (Friday), July 4 (Saturday), and July 5 (Sunday), it seems possible to fill in the missing days with data that should approximate what occurred so that a full month can be estimated.

Depending on the month and day, staff did not review the middle of the night when it became apparent that there was negligible effort. This was done on a day by day basis when traffic appeared to stop and when it appeared to recommence. In the summer the unreviewed period might be relative short (none skipped or just midnight to 2am), and in the winter weekdays the period might be extensive, e.g. 4pm-5am. If the day was so stormy that no effort was practicable, staff would check several times to determine that the day remained stormy. Staff noted the start time for each day and when the first counted boats occurred (commercial boats not counted). If recreational traffic appeared sooner than expected, staff would restart at an earlier time so staff has high confidence that there would not be substantial missed traffic, but there were probably a few boats missed each month due to this procedure.

#### 1b. The boats

The OC Inlet is incredibly busy in the summer months. To simplify counting for this project, only vessels that might reasonably be engaged in recreational fishing were counted. Counting was segregated by am and pm. Vessels not counted included government vessels, commercial fishing vessels, thrill rides, parasailing boats, jet skis, and kayaks. Jet skis are very prevalent and go back and forth across the inlet threshold, but negligible fishing on jet skis was observed. Negligible kayaking was observed to leave the inlet. The inlet is too busy to simultaneously count in both directions – only outbound vessels were generally recorded.

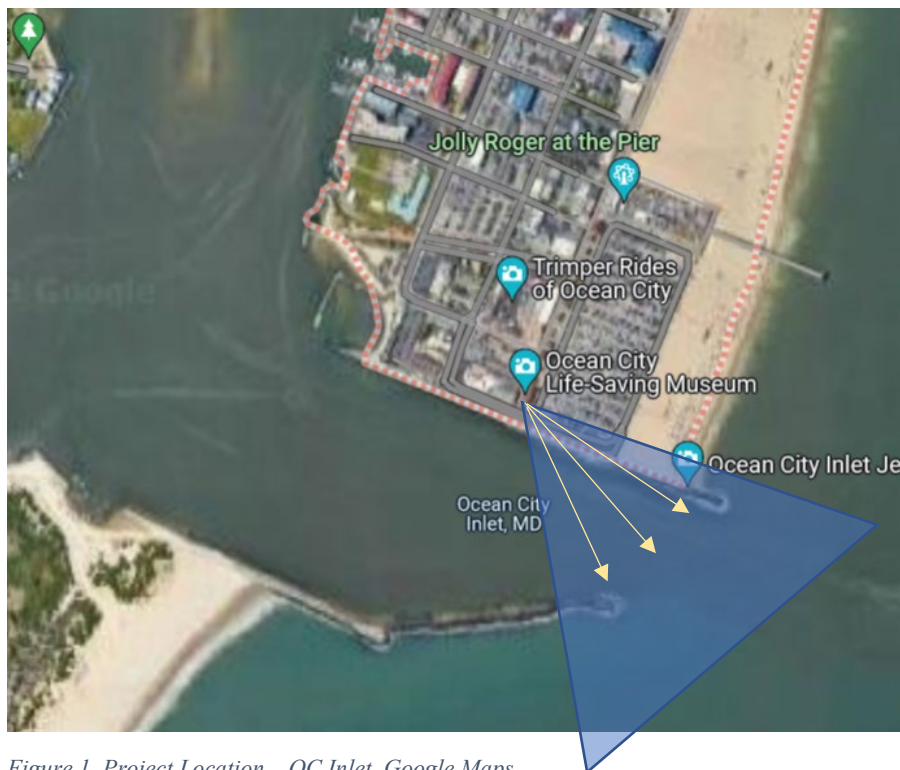


Figure 1. Project Location – OC Inlet, Google Maps

One camera was utilized with its view arc approximated in Figure 1. Most vessels turn left/north departing the inlet due to shoals to the southeast, but some will turn south behind a jetty or cross the shoals. Based on an October 2022 meeting in Ocean City, MD with several local captains, 5 categories of vessels that went through the inlet and went out of view or out of the view arc were counted: (1) small/medium powerboats (except as described above) that turn left or proceed east; (2) large powerboats (“cabin cruisers” and/or “deadrisers”); (3) sailboats; (4) “maybes” - generally very small or very large powerboats that appear unlikely to engage in fishing; and (5) power boats, generally smaller, that turn south and disappear out of view. Vessels that fish in the inlet or in the immediate vicinity of the jetty ends or just outside the inlet were not counted. They most often fish these areas for a short period of time before going back into the bays and are unlikely to report ocean fishing as their primary fishing area when interviewed by the MRIP program.

This approach was used due to both simplifying the counting, and to allow different estimates of anglers per boat or chance of “ocean fishing” to be applied later, per discussion below. The qualitative vessel-type judgement of the reviewer introduces immediate uncertainty into any counts. The most acute issue is probably the parasailing operations, which frequently use the inlet with several vessel styles and are similar to many boats that may be fishing, especially when viewed in fast-forward. An effort was made to exclude them from counts, but there are certainly some that were counted, and some boats that may have appeared very similar to the parasailing boats that may have not been counted. To the extent practicable, vessels are tracked visually and not counted if they make a U-turn and reenter the inlet/back bays, which happens with some frequency. The reviewer cannot pick up all such returns visually especially during busy times. It is virtually certain that some boats transited the inlet twice in one outing and were counted twice – viewing in any degree of fast forward does not allow tracking of individual vessels. It is also certain that some boats, perhaps a substantial portion that get counted, never fished but were only out for a cruise. There are also probably some small commercial boats that were counted as large powerboats and some large powerboats that were perceived as small commercial boats and not counted.

Ranges of boats fishing are used to account for this behavior, and this provides a transition into the methods eventually used to estimate potential ranges of trips. Each category is addressed separately, and at this point the approaches are best described as “analysts prerogative.” They are informed by the meeting with several local captains in October 2022 and observed vessel behavior.

Small Powerboats that turn left or proceed generally eastward. Trips departing before 9am generally appear headed off-shore and probably have a very high percentage of “ocean fishing.” Trips later in the day are less certain in terms of ocean fishing activity versus cruising or fishing mostly in the back bays. Staff assigned the following chances for these vessels to be “ocean fishing.”

- a. July-Aug: 60%-80% fishing (more cruising)
- b. Oct-Dec: 75%-90% fishing (more fishing in offseason)
- c. September: 67.5%-85% fishing (in between a. and b.)

Large Powerboats: these are boats that appear designed and dedicated for fishing. They may or may not be charters – charter for hire activity is subtracted from estimates, as described later.

- d. July-Aug: 90%-95% fishing (fewer migrating transients, more recreational boats relative to potential commercial mis-IDs)
- e. Oct-Dec: 80%-90% fishing (more migrating transients, fewer recreational boats relative to potential commercial mis-IDs)
- f. September: 85%-92.5% fishing (in between a. and b.)

Sailboat activity was negligible (won't affect estimates much)

- g. All: 0% - 10% fishing

The “Maybes” did not appear likely to be fishing but were not completely dismissed. They could be very small powerboats or large cruisers without a fishing deck. There are not substantial numbers (won't affect estimates much).

- h. July-Aug: 20%-30% fishing
- i. Oct-Dec: 10%-20% fishing (more migrating transiting)
- j. September: 15%-25% fishing (in between a. and b.)

Boats headed out of sight to the south. These are generally smaller boats, but many appear to be “fishy.” They probably often spent more time in the back bays than in the ocean.

- k. All: 25%-50%

MRIP staff provided data from Maryland dockside intercepts for private ocean trips and for-hire ocean trips. The following 95% Confidence Intervals were observed for anglers per boat:

2020 Private/rental: 3.0 - 4.5 anglers per boat

2020 For Hire: 4.1 to 5.8 anglers per boat

2021 Private/rental: 3.2 - 4.0 anglers per boat

2021 For Hire: 5.2 – 6.5 anglers per boat

Wave by wave angler per boat estimates are available and could be matched to the monthly estimates but given the nature of this exercise, the annual values seemed likely sufficient to guide a range selection. While the for-hire data may not be directly applicable to the “Large Powerboat” category, it seemed reasonable given the similar vessel type. Based on these data and conversations with local captains at the October 2022 meeting in Ocean City and personal experience, staff used the following ranges for anglers fishing on each vessel type (the first two are the ones that most impact the video-based effort ranges):

1. Small Powerboats: 3-4 people
2. Large Powerboats: 5-6 people
3. Sailboat: 1-2 people
4. “Maybes”: 1-2 people
5. Small/Medium boats to the South: 3-4 people

Staff then created ranges of trips by applying the low percent fishing and low number of people per boat to create a “low range” and applying the high percent fishing and high number of people per boat to create a “high range” for each vessel type and month. While the resulting range is not a confidence interval like MRIP estimates, it seemed a reasonable way to at least partly account for the facts that not all boats traversing the inlet are going to be fishing, and the number of people per boat has some variability. With the boat counts, a range of fishing participation, and a range of anglers per boat, one can construct a range of possible trips, though this range still doesn’t fully account for all uncertainties as discussed above.

Once the trip estimates from all the vessel types were tallied, then charter for-hire effort must be subtracted to get to a value that is a closer comparison to the MRIP private/rental trip estimates that were of interest. Staff retrieved the relevant wave charter ocean for-hire estimates from the MRIP website. Staff then calculated the 95% confidence interval range (see confidence interval discussion below). Staff then divided the wave estimate in half for a relevant monthly estimate. Staff then deducted the high charter for-hire estimate from the low initial video trip range for a low final video trip estimate, and deducted the low charter for-hire estimate from the high initial video trip range for a high final video trip estimate. For example, if the confidence interval for charter for hire trips for a wave was 500-1,000, that’s 250-500 for one month of that wave. If the initial video trip month range (which includes some charter for hire activity) was 10,000-20,000, then the final video estimate would be 9,500 (10,000 minus 500) to 19,750 (20,000 minus 250).

The created ranges are intended to capture some of the uncertainty involved with the boat counting approach, but as discussed below for MRIP’s confidence intervals, they can not fully capturing all the uncertainties involved.

## 2. Estimating Effort With MRIP

This section borrows/copies heavily from these MRIP Websites:

<https://www.fisheries.noaa.gov/recreational-fishing-data/fishing-effort-survey-glance>

<https://www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements>

<https://www.fisheries.noaa.gov/recreational-fishing-data/hire-survey-glance>

<https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-glossary>

NOAA Fisheries' Marine Recreational Information Program administers a household mail Fishing Effort Survey (FES) from Main to Mississippi and in Hawaii. FES is self-administered and collects trip information for each resident of a responding household where we ask them to report their trips over a specified time period. To sample, we use a USPS list of residential addresses matched to the National Saltwater Angler Registry, which is a database of licensed anglers. This creates a sampling frame of licensed and unlicensed households, and we sample those at different rates. This is done to help obtain a representative sample while optimizing sampling efficiency. The FES replaced a phone-based survey called the Coastal Household Telephone Survey (CHTS).

Each year, about 300,000 residential households across 17 states receive the Fishing Effort Survey in the mail. Response rates are consistently above 30 percent. Because research shows response rates increase when participants are compensated for their time and asked about topics other than fishing, the Fishing Effort Survey includes a \$2 prepaid cash incentive and questions about weather and outdoor activity. A response from someone who didn't fish at all is just as valuable to our survey as one from someone who fished every day.

While the Fishing Effort Survey is only sent to households in coastal states, the Access Point Angler Intercept Survey (APAIS) is conducted with recreational anglers regardless of where they reside. Because the APAIS asks anglers to report their state and county of residence, its data can be used to calculate a coverage adjustment that can be applied to our effort estimates to account for out-of-frame angler trips. (It would be expensive and inefficient to conduct the FES in non-coastal states, where the likelihood of reaching households whose residents participated in marine recreational fishing is low.) The APAIS survey is also used to apportion the total saltwater trips into locations such as inland or ocean.

Studies on the FES have found:

- The FES provides a more representative sample of the population we survey.
- The FES is less susceptible to bias resulting from non-response and non-coverage.
- The FES gives more household members more time to provide complete answers, which is believed to produce more accurate responses to questions about fishing activity.
- The FES is more efficient than the CHTS.
- Differences between CHTS and FES estimates can largely be attributed to differences in fishing activity between the households in each survey's sample frame. These differences in fishing activity are correlated with differences in demographic characteristics, such as age, gender, and number of children at home. It is generally understood that the telephone survey did a poorer and poorer job over time of reaching people who fished as people switched to cell phones and could not be reached. The mail survey is also more likely to get to the person in the household who best knows about fishing activity (phone calls were being screened out more and more).

On December 31, 2017, the CHTS was discontinued. As of January 1, 2018, the FES is used to produce all federal estimates of fishing effort. Based on three years of overlap with the FES and CHTS, a calibration model was peer reviewed and used to convert older effort estimates dating back to 1981 to an "apples to apples" trip "currency" of the FES.

The number of trips taken from for-hire vessels is collected through the For-Hire Survey. Recall these must be deducted from the initial video counts to get something similar to MRIP's private/rental counts. The For-Hire Survey is conducted by state agency staff, who call a random sample of for-hire vessel operators each week. All For-Hire Survey respondents are asked to report their vessels' fishing activity during the previous week and to recount details from each trip, including:

Number of vessel trips with paying passengers taken that week

Number of anglers that fished from the vessel on each trip

The resulting data are used to estimate the number of angler trips taken from for-hire vessels. These for-hire effort estimates are paired with the for-hire catch-per-trip estimates we derive from our dockside angler intercept survey to estimate total for-hire catch. In the Greater Atlantic, electronic vessel trip reports supplement the For-Hire Survey. While the vessels that must submit eVTRs are still part of the For-Hire Survey sample frame, they are not called to participate. Data collected through these eVTRs are used alongside data collected through the For-Hire Survey to estimate total for-hire fishing effort.

### Point Estimates, PSEs, and Confidence Intervals

It is useful to review what the MRIP estimates mean and how to interpret the associated Proportional Standard Errors (PSEs) that accompany the point estimates as indications of uncertainty. For example, for private boat ocean effort from Maryland in Wave 4 (July/August) of 2020, MRIP provides a point estimate of 185,341 angler trips with a PSE of 39.7% (or 0.397). Based on how the PSEs are calculated (the standard error of an estimate as a percentage of the estimate), one can construct a 95% confidence interval using the PSE and assuming a normal distribution: plus or minus the percent “1.96 \* the PSE” will provide a 95% confidence interval. In the example above,  $1.96 * .397 = \text{plus or minus } 78\%$ . For this example minus 78% makes the bottom of the confidence interval range 41,123 trips and plus 78% makes the top of the confidence interval range 329,559 trips (it’s a little less than 78% so there’s a bit of rounding error). An MRIP query for effort for 2020 private boat ocean effort from Maryland can provide the results as a graph with this range illustrated, as shown below (2020 Waves 3-6).

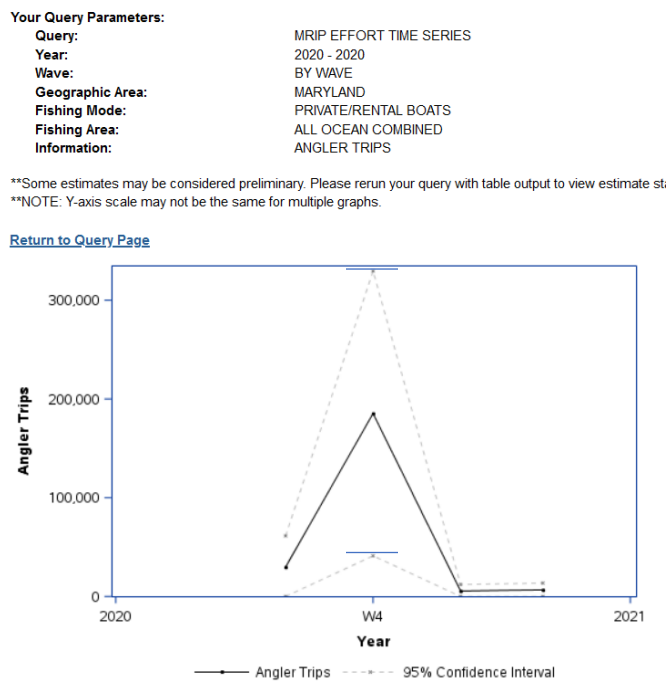


Figure 2. MRIP 2020 Maryland Private/rental ocean trips.



The 95% confidence interval has a specific meaning worth reviewing. In our case it means that if you had a time machine and could have randomly re-sampled the same event 20 times, the true value for the population being surveyed would be contained in the resulting estimates' confidence intervals 19/20 times (95% of the time). The following figure illustrates (with made up data) the information you get from a 95% confidence interval.

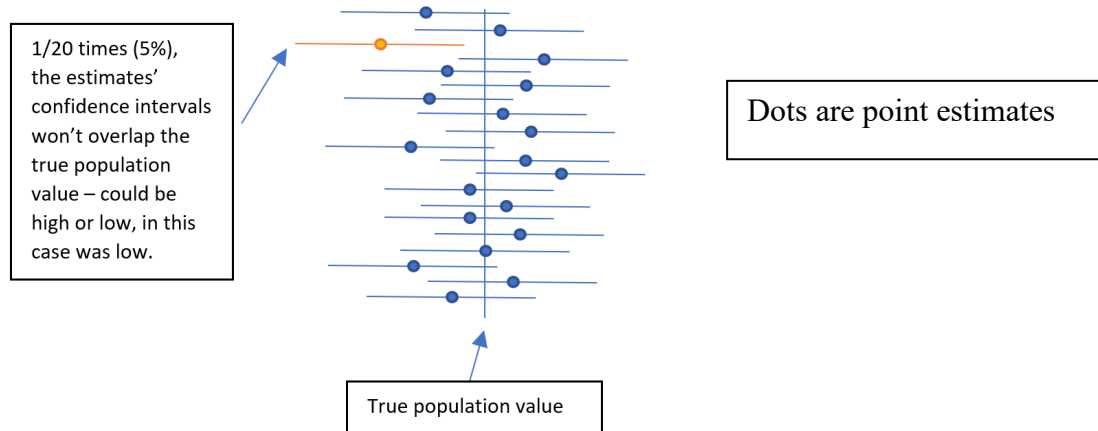


Figure 3. 95% Confidence Interval Illustration

The uncertainties described by the PSEs and illustrated by the confidence intervals do not fully capture the uncertainty involved in MRIP estimates (nor has MRIP claimed they could/would). For example, if the sampled population systematically does not match the full relevant population, there is the potential for systematic bias that cannot be reflected in the uncertainty conveyed by the PSEs – this was why the estimate changes with the MRIP mail-based fishing effort survey were so out of the bounds of previous years' estimated PSEs. The PSEs can only reflect the uncertainty inherent in the sample design and the variability of the data that is collected. Mismatch between the sampled population and its representativeness of the entire fishing population can't be incorporated into the PSEs, is a factor in every survey, and several peer reviews have concluded that the current MRIP design should be substantially less biased than previously was occurring (i.e. it does a better job of sampling the entire fishing population). Other sources of variability like anglers' ability to accurately recount trips over a recent 2-month period are also not reflected in the PSEs. Potential other sources of bias like differences in catch rates between private-dock-based anglers and public access sites also are not integrated into PSEs. These are known potential issues and MRIP engages in ongoing research to determine and account for potential problems like these. For the purposes of this project, the main point is that not all uncertainties are (or can be) captured by the confidence intervals published by MRIP, including for the Maryland ocean effort estimates.

The relevant MRIP estimates are provided below. One will note that when the PSE is greater than 51, the lower 95% confidence interval bound extends down to zero and the upper confidence interval bound extends at least double the estimate. ( $51\% \times 1.96 = \pm 100\%$ ). The Charter boat estimates are divided by 2 because they are 2-month wave estimates and are deducted from monthly video estimates.

Table 1. Overlapping MRIP Maryland 2020 Ocean Private Boat Effort Estimates

Year	Wave	Angler Trips	PSE	Low	High
2020	JULY/AUGUST	185,341	39.7	41,123	329,559
2020	SEPTEMBER/OCTOBER	5,568	59.7	0	12,083
2020	NOVEMBER/DECEMBER	6,682	52.2	0	13,518
	Total	197,591	37.3	53,006	342,177

Table 2. Overlapping MRIP Maryland 2021 Ocean Private Boat Effort Estimates

Year	Wave	Angler Trips	PSE	Low	High
2021	SEPTEMBER/OCTOBER	60,447	55.2	0	125,846
2021	NOVEMBER/DECEMBER	10,472	37.1	2,857	18,087
	Total	70,919	47.4	5,051	136,787

Table 3. Overlapping MRIP Maryland 2020 Ocean Charter Boat Effort Estimates

Year	Wave	Angler Trips	PSE	Low	Low/2	High	High/2
2020	JULY/AUGUST	6,420	34.1	2,042	1,021	10,798	5,399
2020	SEPTEMBER/OCTOBER	1,822	27.5	820	410	2,824	1,412
2020	NOVEMBER/DECEMBER	49	16.2	33	17	65	32

Table 4. Overlapping MRIP Maryland 2021 Ocean Charter Boat Effort Estimates

Year	Wave	Angler Trips	PSE	Low	Low/2	High	High/2
2021	SEPTEMBER/OCTOBER	1,022	22	570	285	1,474	737
2021	NOVEMBER/DECEMBER	0	0	0	0	0	0

### 3. Video Counts and Comparisons With MRIP

Section A) below provides the boat counts for each month for small/medium, large, and small/medium turned south boats. The sailboats and “maybes” were low enough that they do not contribute in a meaningful fashion but are available in Appendix 1.

Section B) below provides the MRIP ocean private trip effort confidence intervals and the trip effort ranges from this project (with charter for-hire ranges deducted) side by side. The trip ranges from this project are **not** statistical confidence intervals and their construction is based on the boat counts and the range-finding procedures described above.

- A) The following figures describe the small/medium boat, large, and small/medium south boat counts each month. The axis were all set to be the same – while it is harder to see the day to day variability in less active months, the differences in scale seemed more important to note.

Figure 4. July 2020 Boat Counts

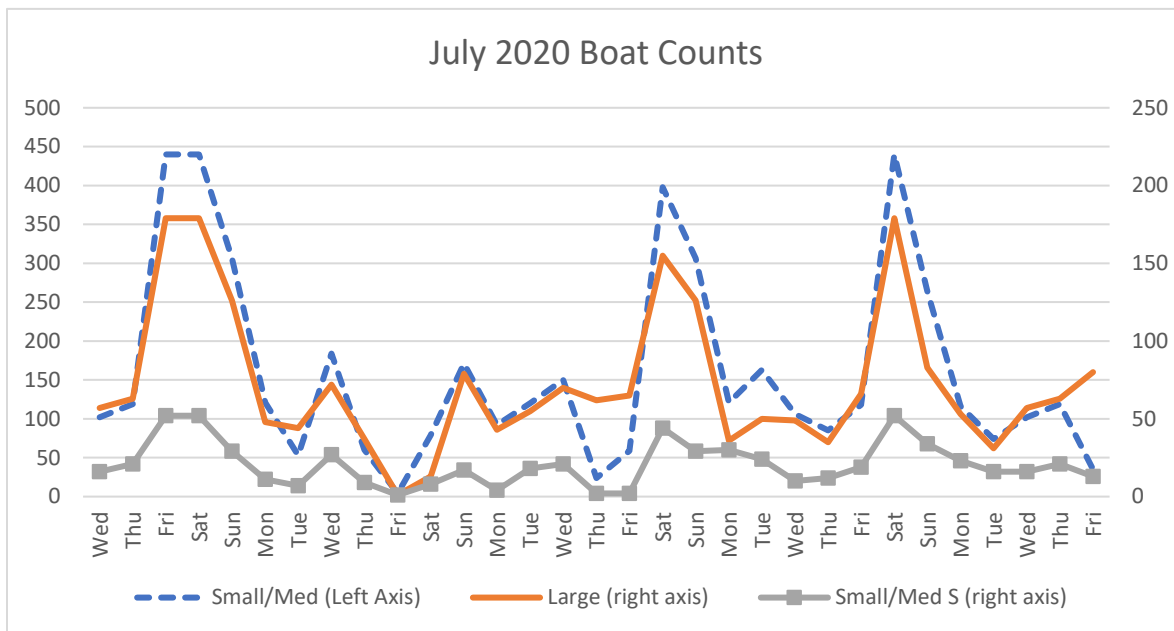


Figure 5. August 2020 Boat Counts

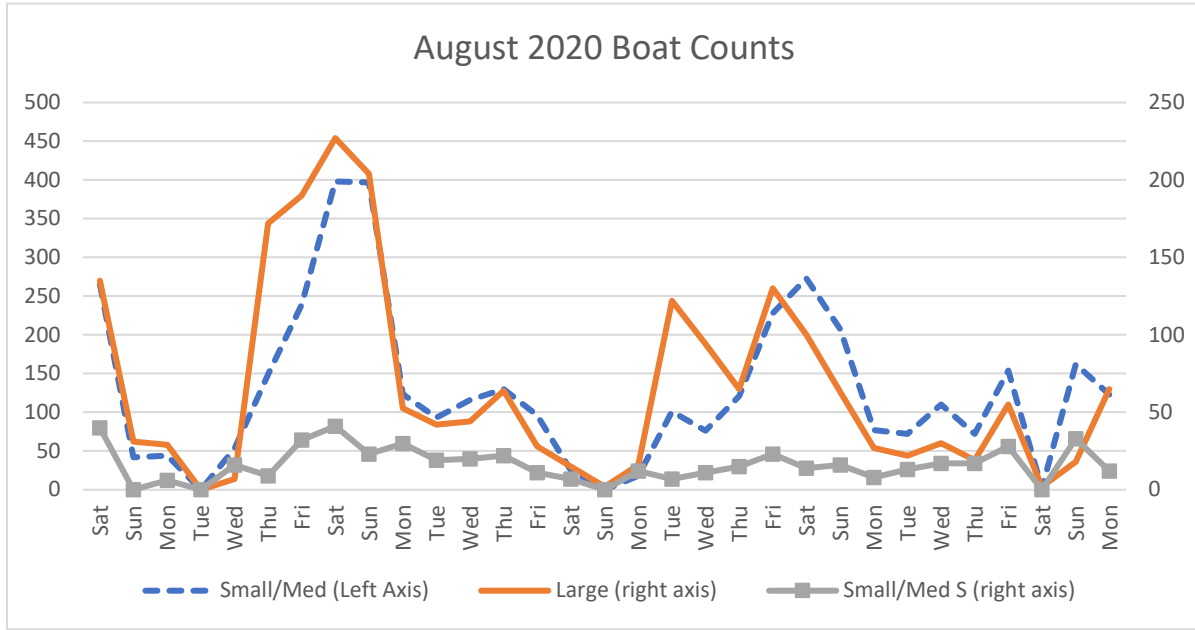


Figure 6. September 2020 Boat Counts

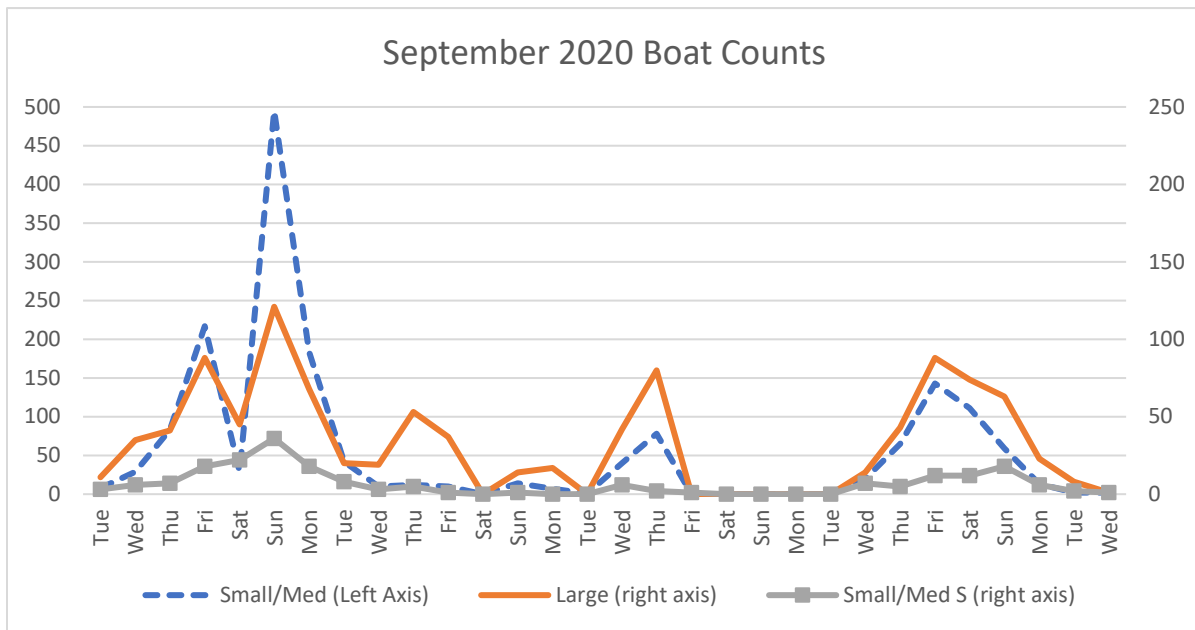


Figure 7. October 2020 Boat Counts

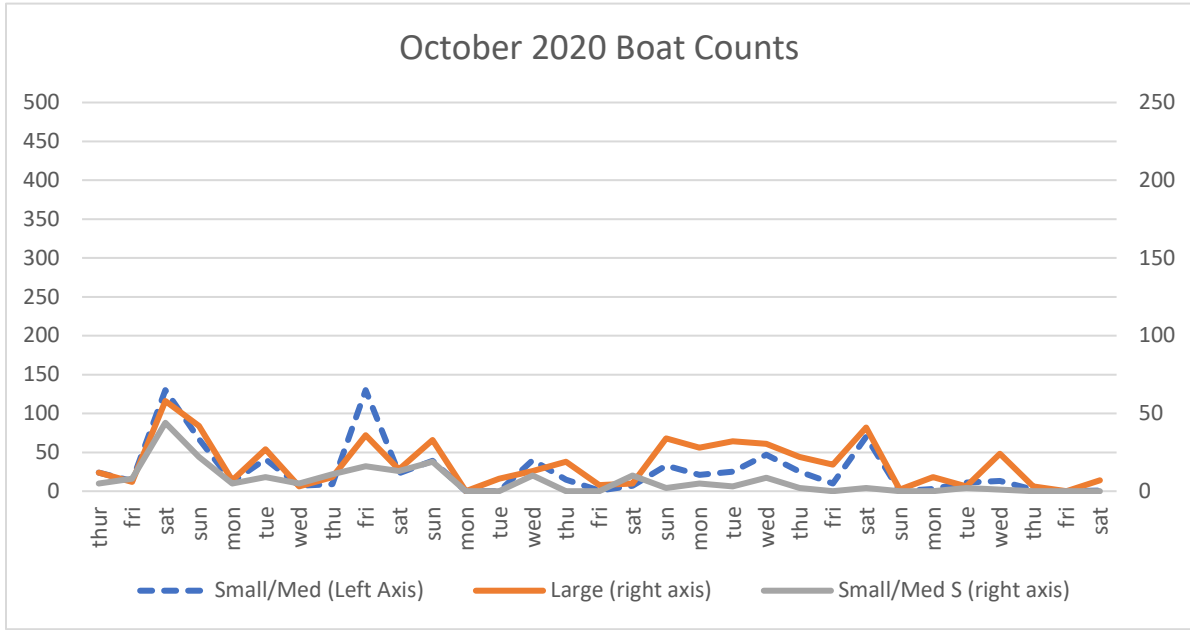


Figure 8. November 2020 Boat Counts

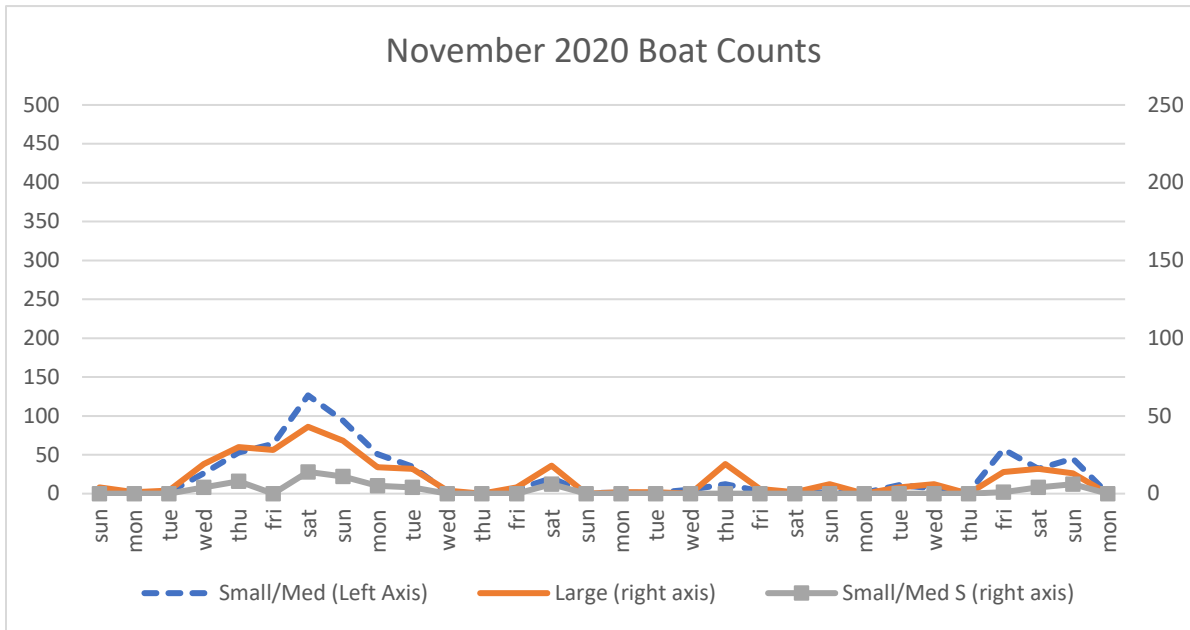


Figure 9. December 2020 Boat Counts

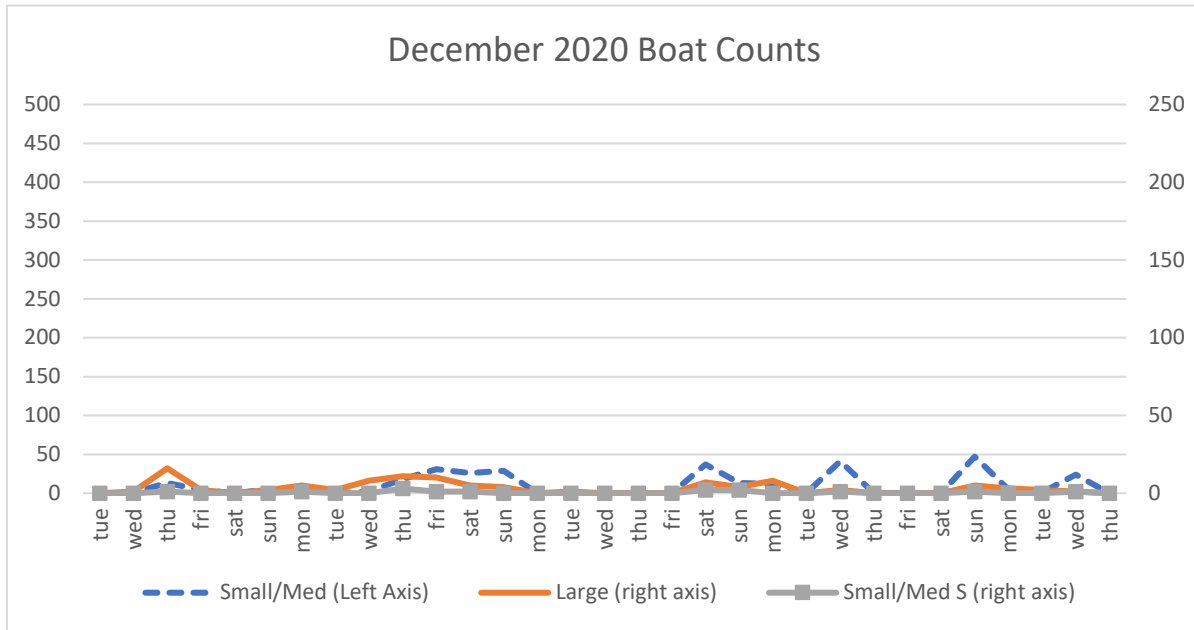


Figure 10. September 2021 Boat Counts

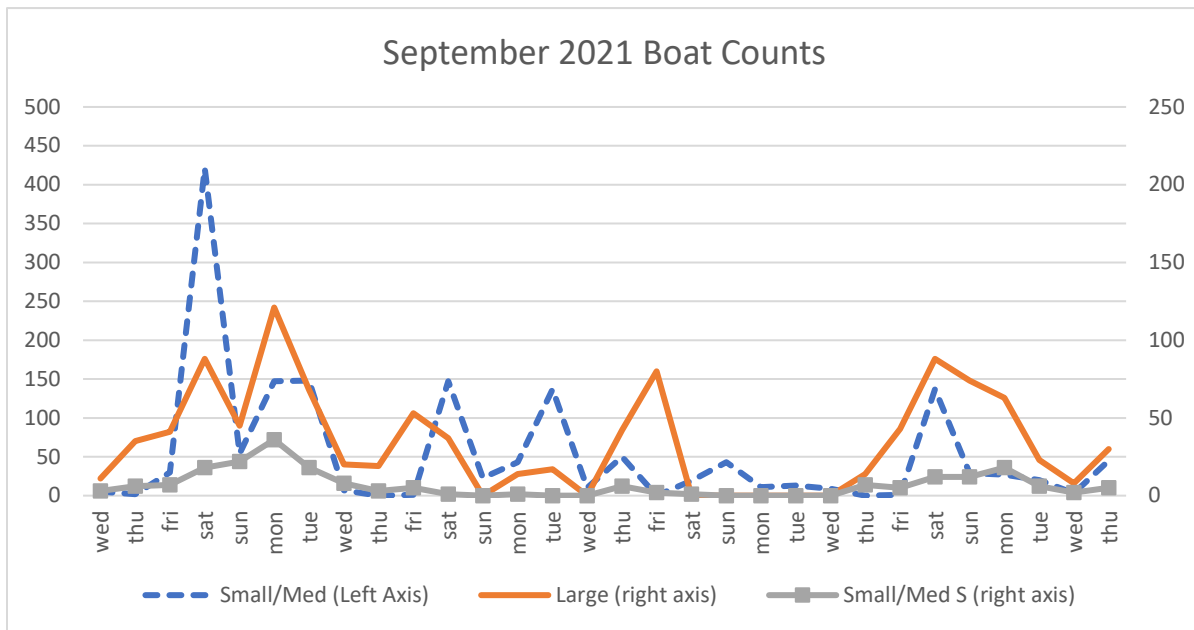


Figure 11. October 2021 Boat Counts

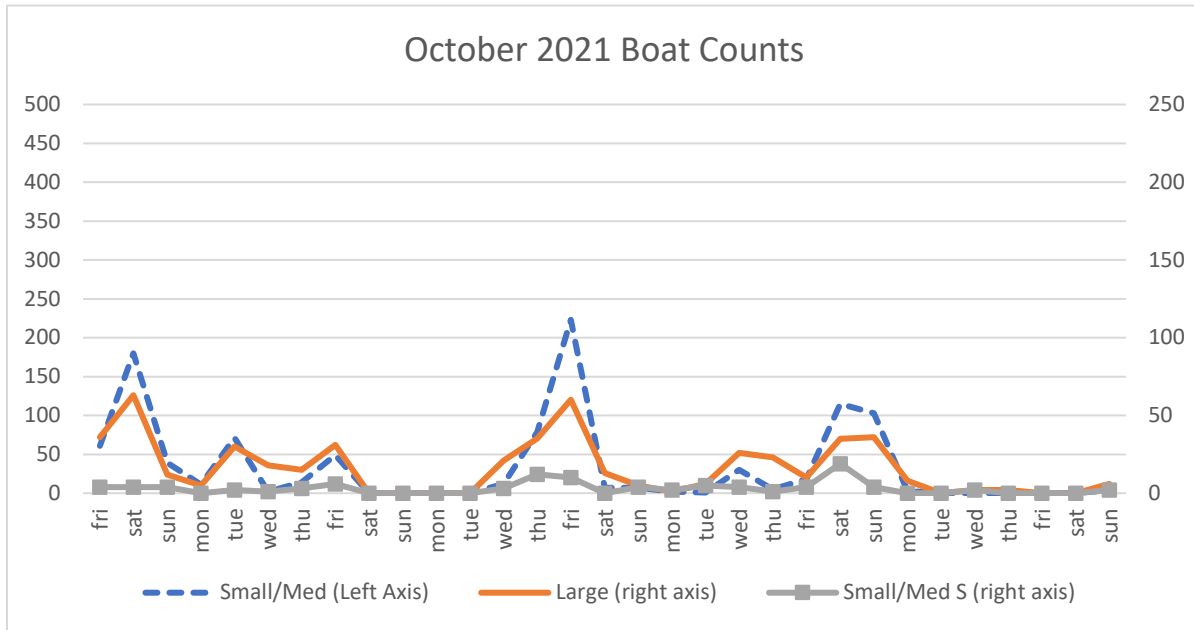


Figure 12. November 2021 Boat Counts

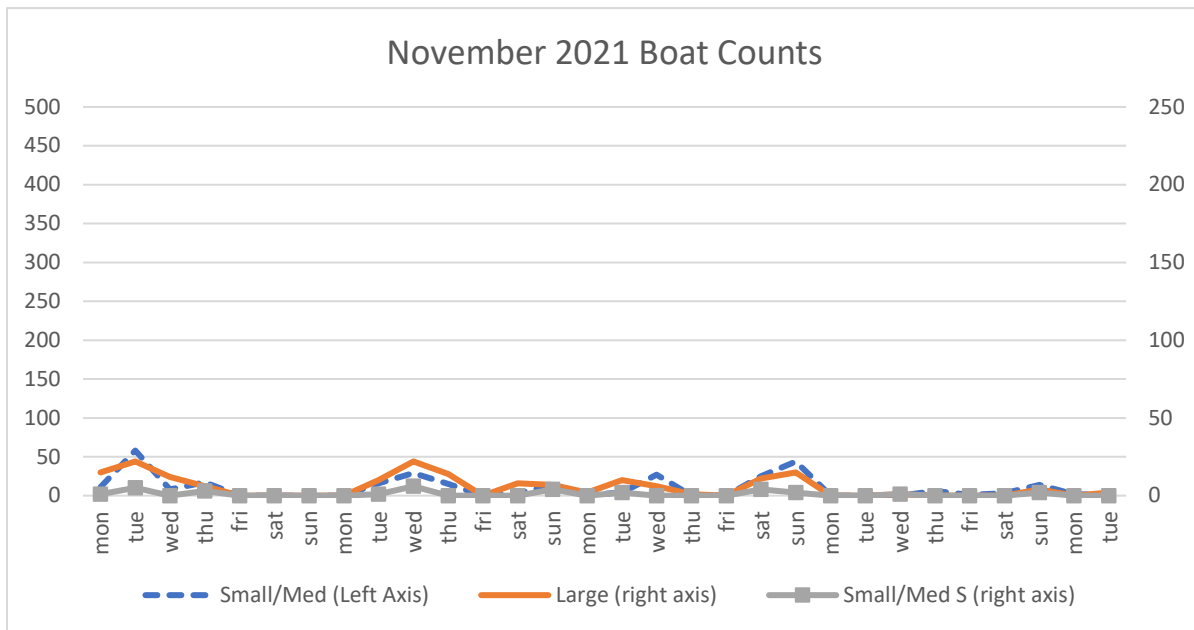
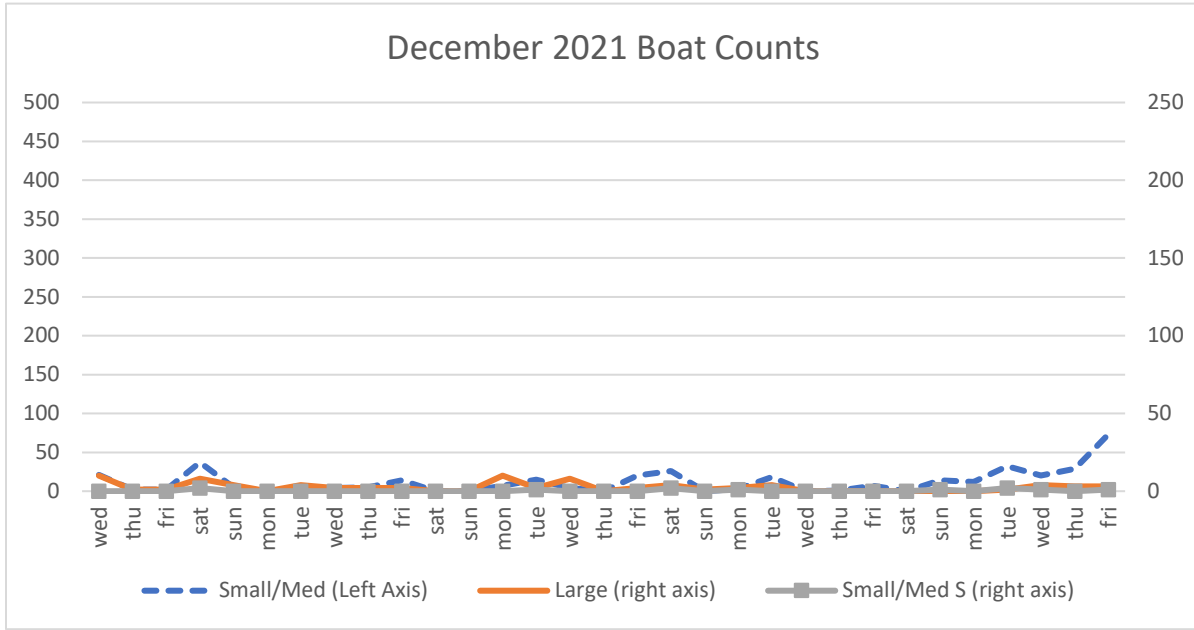


Figure 13. December 2021 Boat Counts



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B) The following figures describe the trips ranges generated from the MRIP estimate confidence intervals and the Video Count Ranges. There is overlap in each case. The MRIP ranges are the 95% confidence intervals. The video ranges combine the boat counts, range of percent fishing, range of people per boat, and range of charter trips as detailed above.

Figure 14. Wave 4 2020 Trips



Figure 15. Wave 5 2020 Trips



Figure 16. Wave 6 2020 Trips

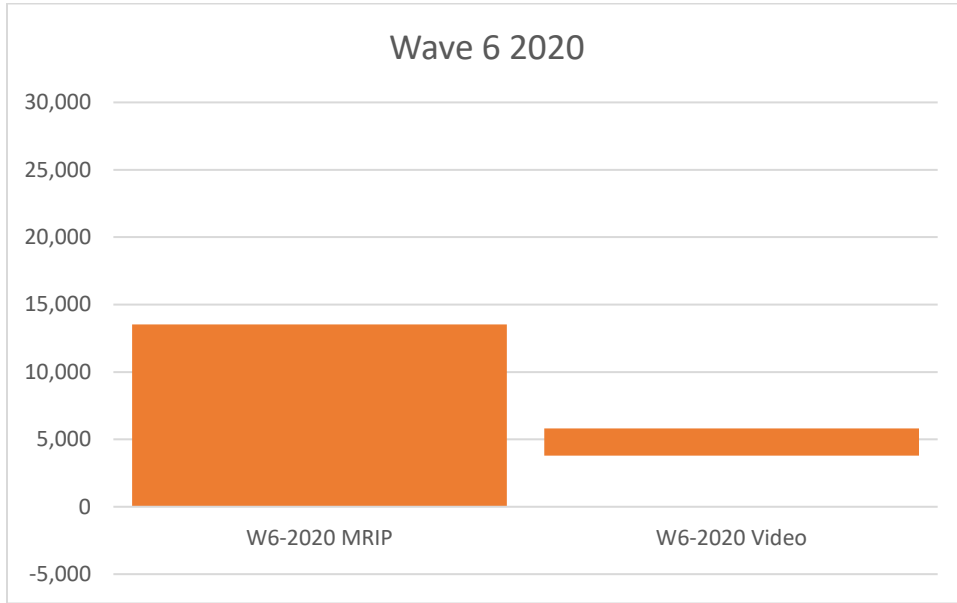


Figure 17. Wave 5 2021 Trips

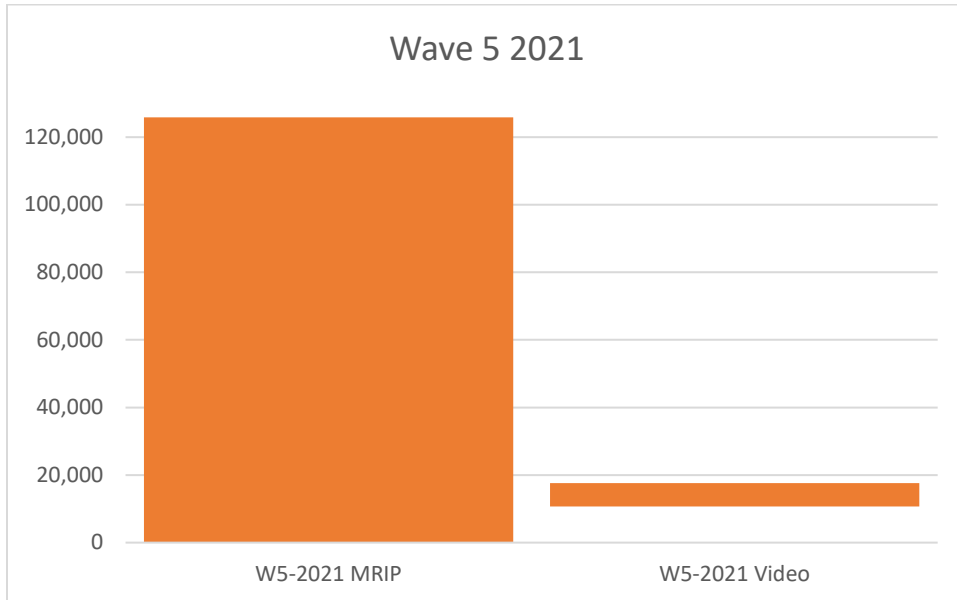
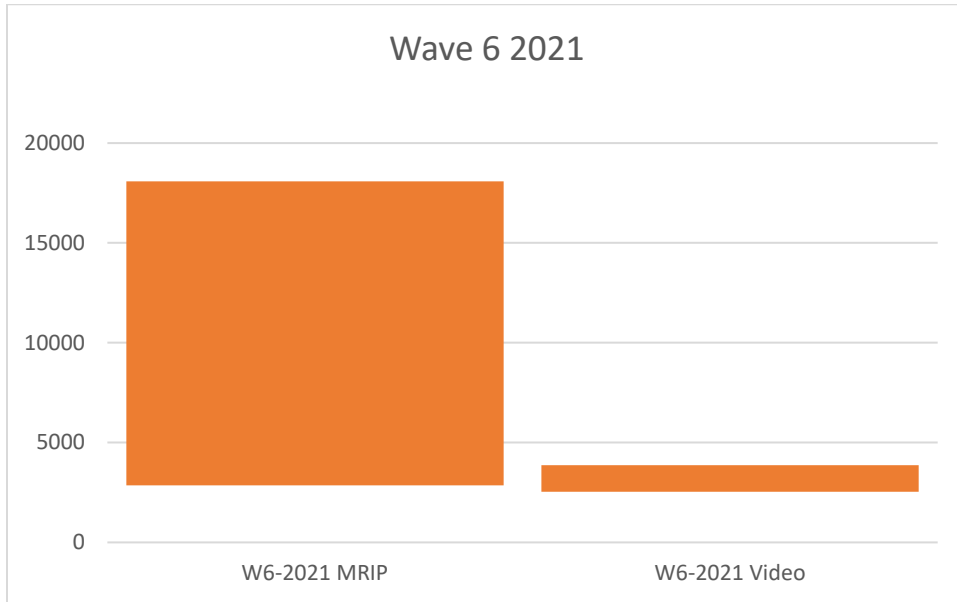


Figure 18. Wave 6 2021 Trips



## Lessons Learned

As we were finalizing implementation of this project, a review paper on video-based effort counting was published, which highlights many of the issues we encountered. Had that paper been published a few years earlier this project would have likely been modified (Hartill et al 2020 - Digital camera monitoring of recreational fishing effort: Applications and challenges. Fish and Fisheries. Volume 21, Issue 1 <https://onlinelibrary.wiley.com/doi/abs/10.1111/faf.12413>).

1. Logistics and equipment issues were major challenges. Any use of a similar system for conducting actual estimates would have to have additional redundancies to avoid loss of data collection. Substantial on-site presence and additional information technology skills would be needed to monitor and correct problems.
2. Video retrieval, storage, and viewing were major challenges and extended the time needed to complete the project. It is likely that different systems could automatically retrieve data and store to the cloud with a file type that is more accessible.
3. This location provided a good view of the inlet. However, the inlet was busier than anticipated, limiting the speed at which video could be reviewed and extending the time required to complete the project. Also, the uncertainty about vessel behavior out of view complicates interpretation of the counts. The geography of the area is conducive to funneling effort and viewing the inlet, but the shoal offshore creates a complicated pattern of vessel behavior after leaving the inlet. A very wide angle could help see where vessels go, but the busyness of the inlet limits the amount of time one can track any given vessel and would make it difficult to discern vessel types. Multiple cameras would greatly add to the complexity of using cameras to count vessels. It may be possible that machine learning/ artificial intelligence could be used to automate counting, but the behavior of jetskis, boats that often fish near the inlet threshold, and non-fishing parasailing operations would seem likely to complicate automatic counting. The issue of vessel behavior once beyond the inlet threshold would also be a continuing challenge without an immediate solution. With the contractor who we had hoped would do substantial counting, there was only one day (1 of 3) of overlapped counting with even low activity due to weather. The numbers for large, sail, maybes, and small/medium boats south were very similar but Council staff's count of small/medium boats N/E was 7 while the contractors count was 13. A second count by staff led to the same initial staff number – the difference was staff's perception of boats that only fished for a short time outside the inlet or appeared likely to have re-entered the view frame relatively quickly and returned to the bay. So while staff remained confident that staff's count was reasonable, this highlighted that a video count could be very sensitive to the individual counter and their interpretation of the complex vessel behavior around the inlet.
4. The uncertainty of MRIP estimates at this fine scale, especially given full years were not able to be captured, limits the ability to make meaningful comparisons with MRIP.
5. Given the challenging behavior of vessels once clearing the inlet, the counts provided some perspective on vessel activity at low cost, but staff does not immediately see a path to how a relatively simple video system could be used to reliably estimate ocean recreational fishing effort in Maryland.

# Appendix 1 – Vessel Count and Trip Tables

July 2020

Day	Date	Vessels					People on boat	People Low					Low Sub	People High					High Sub
		Small/Med (Left Axis)	Large (right axis)	Sail	Maybes	Small/Med S (right axis)		Small/Me d	Large	Sail	Maybes	Small/Me d S		Small/Me d	Large	Sail	Maybes	Small/Me d S	
							3	5	1	1	3		4	6	2	2	4		
							% Boats Fishing	60%	90%	0%	20%	25%	80%	95%	10%	30%	50%		
Wed	1	102	57	2	2	16	184	257	0	0	12	453	326	325	0	1	32	685	
Thu	2	119	63	2	3	21	214	284	0	1	16	514	381	359	0	2	42	784	
Fri	3	440	179	1	4	52	792	806	0	1	39	1,637	1,408	1,020	0	2	104	2,535	
Sat	4	440	179	1	4	52	792	806	0	1	39	1,637	1,408	1,020	0	2	104	2,535	
Sun	5	307	126	0	2	29	552	568	0	0	22	1,142	981	719	0	1	58	1,760	
Mon	6	121	48	0	3	11	218	216	0	1	8	443	387	274	0	2	22	685	
Tue	7	53	44	4	1	7	95	198	0	0	5	299	170	251	1	1	14	436	
Wed	8	184	72	3	15	27	331	324	0	3	20	678	589	410	1	9	54	1,063	
Thu	9	60	37	2	2	9	108	167	0	0	7	282	192	211	0	1	18	423	
Fri	10	4	1	0	0	1	7	5	0	0	1	12	13	6	0	0	2	21	
Sat	11	79	13	1	1	8	142	59	0	0	6	207	253	74	0	1	16	344	
Sun	12	171	79	0	5	17	308	356	0	1	13	677	547	450	0	3	34	1,035	
Mon	13	92	43	0	3	4	166	194	0	1	3	363	294	245	0	2	8	549	
Tue	14	120	55	3	3	18	216	248	0	1	14	478	384	314	1	2	36	736	
Wed	15	150	70	1	2	21	270	315	0	0	16	601	480	399	0	1	42	922	
Thu	16	24	62	2	1	2	43	279	0	0	2	324	77	353	0	1	4	435	
Fri	17	59	65	4	0	2	106	293	0	0	2	400	189	371	1	0	4	564	
Sat	18	398	155	1	0	44	716	698	0	0	33	1,447	1,274	884	0	0	88	2,245	
Sun	19	307	126	0	2	29	552	568	0	0	22	1,142	981	719	0	1	58	1,760	
Mon	20	121	36	1	4	30	218	162	0	1	23	403	387	205	0	2	60	655	
Tue	21	163	50	3	3	24	293	225	0	1	18	537	522	285	1	2	48	857	
Wed	22	106	49	2	3	10	191	221	0	1	8	419	339	279	0	2	20	641	
Thu	23	85	35	0	3	12	153	158	0	1	9	320	272	200	0	2	24	497	
Fri	24	118	66	0	2	19	212	297	0	0	14	524	378	376	0	1	38	793	
Sat	25	440	179	1	4	52	792	806	0	1	39	1,637	1,408	1,020	0	2	104	2,535	
Sun	26	264	83	2	4	34	475	374	0	1	26	875	845	473	0	2	68	1,389	
Mon	27	116	53	2	2	23	209	239	0	0	17	465	371	302	0	1	46	721	
Tue	28	74	31	2	1	16	133	140	0	0	12	285	237	177	0	1	32	447	
Wed	29	102	57	2	2	16	184	257	0	0	12	453	326	325	0	1	32	685	
Thu	30	119	63	2	3	21	214	284	0	1	16	514	381	359	0	2	42	784	
Fri	31	35	80	1	0	13	63	360	0	0	10	433	112	456	0	0	26	594	

# August 2020

Day	Date	Vessels					People Low					People High					High Sub	
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)	Small/Me d	Large	Sail	Maybes	Small/Me d S	Low Sub	Small/Me d	Large	Sail	Maybes		Small/Me d S
							3	5	1	1	3		4	6	2	2	4	
						People on boat % Boats Fishing	60%	90%	0%	20%	25%		80%	95%	10%	30%	50%	
Sat	1	265	135	4	11	40	477	608	0	2	30	1,117	848	770	1	7	80	1,705
Sun	2	42	31	0	3	0	76	140	0	1	0	216	134	177	0	2	0	313
Mon	3	44	29	1	1	6	79	131	0	0	5	214	141	165	0	1	12	319
Tue	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wed	5	53	7	3	1	16	95	32	0	0	12	139	170	40	1	1	32	243
Thu	6	149	172	0	3	9	268	774	0	1	7	1,050	477	980	0	2	18	1,477
Fri	7	239	190	1	2	32	430	855	0	0	24	1,310	765	1,083	0	1	64	1,913
Sat	8	398	227	3	3	41	716	1,022	0	1	31	1,769	1,274	1,294	1	2	82	2,652
Sun	9	397	204	6	7	23	715	918	0	1	17	1,651	1,270	1,163	1	4	46	2,485
Mon	10	123	53	1	5	30	222	236	0	1	22	482	394	299	0	3	60	757
Tue	11	93	42	4	3	19	168	189	0	1	14	372	298	239	1	2	38	579
Wed	12	116	44	0	4	20	209	198	0	1	15	423	371	251	0	2	40	664
Thu	13	130	64	1	2	22	234	288	0	0	17	539	416	365	0	1	44	826
Fri	14	96	28	2	3	11	173	126	0	1	8	308	307	160	0	2	22	491
Sat	15	25	15	2	0	7	45	68	0	0	5	118	80	86	0	0	14	180
Sun	16	0	2	0	0	0	0	9	0	0	0	9	0	11	0	0	0	11
Mon	17	18	16	0	2	12	32	72	0	0	9	114	58	91	0	1	24	174
Tue	18	101	122	1	3	7	182	549	0	1	5	737	323	695	0	2	14	1,035
Wed	19	76	94	0	2	11	137	423	0	0	8	568	243	536	0	1	22	802
Thu	20	121	65	2	0	15	218	293	0	0	11	522	387	371	0	0	30	788
Fri	21	228	130	1	1	23	410	585	0	0	17	1,013	730	741	0	1	46	1,517
Sat	22	273	100	3	0	14	491	450	0	0	11	952	874	570	1	0	28	1,472
Sun	23	207	63	2	1	16	373	284	0	0	12	668	662	359	0	1	32	1,055
Mon	24	77	27	2	3	8	139	122	0	1	6	267	246	154	0	2	16	419
Tue	25	72	22	3	4	13	130	99	0	1	10	239	230	125	1	2	26	385
Wed	26	110	30	2	2	17	198	135	0	0	13	346	352	171	0	1	34	559
Thu	27	72	19	2	3	17	130	86	0	1	13	228	230	108	0	2	34	375
Fri	28	154	55	2	3	28	277	248	0	1	21	546	493	314	0	2	56	865
Sat	29	2	2	0	0	0	4	9	0	0	0	13	6	11	0	0	0	18
Sun	30	162	18	3	0	33	292	81	0	0	25	397	518	103	1	0	66	688
Mon	31	123	65	0	2	12	221	293	0	0	9	523	394	371	0	1	24	789

# September 2020

Day	Date	Vessels					People Low						People High					
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)	Small/Me d	Large	Sail	Maybes	Small/Me d S	Low Sub	Small/Me d	Large	Sail	Maybes	Small/Me d S	High Sub
							3	5	1	1	3		4	6	2	2	4	
						People on boat % Boats Fishing	67.5%	85%	0%	15%	25%		85%	92.5%	10%	25%	50%	
Tue	1	8	11	1	1	3	16	47	0	0	2	65	27	61	0	1	6	95
Wed	2	29	35	1	1	6	59	149	0	0	5	212	99	194	0	1	12	306
Thu	3	83	41	2	2	7	168	174	0	0	5	348	282	228	0	1	14	525
Fri	4	217	88	2	5	18	439	374	0	1	14	828	738	488	0	3	36	1,265
Sat	5	29	45	1	0	22	59	191	0	0	17	266	99	250	0	0	44	393
Sun	6	495	121	0	9	36	1,002	514	0	1	27	1,545	1,683	672	0	5	72	2,431
Mon	7	184	68	0	2	18	373	289	0	0	14	675	626	377	0	1	36	1,040
Tue	8	42	20	0	1	8	85	85	0	0	6	176	143	111	0	1	16	270
Wed	9	10	19	0	1	3	20	81	0	0	2	103	34	105	0	1	6	146
Thu	10	12	53	0	1	5	24	225	0	0	4	253	41	294	0	1	10	345
Fri	11	10	37	0	0	1	20	157	0	0	1	178	34	205	0	0	2	241
Sat	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sun	13	14	14	2	0	1	28	60	0	0	1	89	48	78	0	0	2	128
Mon	14	7	17	0	2	0	14	72	0	0	0	87	24	94	0	1	0	119
Tue	15	1	0	2	0	0	2	0	0	0	0	2	3	0	0	0	0	4
Wed	16	40	42	0	0	6	81	179	0	0	5	264	136	233	0	0	12	381
Thu	17	78	80	0	0	2	158	340	0	0	2	499	265	444	0	0	4	713
Fri	18	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	2	2
Sat	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sun	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mon	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tue	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wed	23	20	14	0	4	7	41	60	0	1	5	106	68	78	0	2	14	162
Thu	24	65	43	0	0	5	132	183	0	0	4	318	221	239	0	0	10	470
Fri	25	143	88	1	3	12	290	374	0	0	9	673	486	488	0	2	24	1,000
Sat	26	111	74	1	0	12	225	315	0	0	9	548	377	411	0	0	24	812
Sun	27	59	63	1	2	18	119	267	0	0	14	401	201	349	0	1	36	587
Mon	28	13	23	1	2	6	26	98	0	0	5	129	44	128	0	1	12	185
Tue	29	2	8	0	1	2	4	34	0	0	2	40	7	44	0	1	4	56
Wed	30	2	1	1	0	1	4	4	0	0	1	9	7	6	0	0	2	15

October 2020

Day	Date	Vessels					People Low					People High					High Sub	
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)	Small/Me d	Large	Sail	Maybes	Small/Me d S	Low Sub	Small/Me d	Large	Sail	Maybes		Small/Me d S
							3	5	1	1	3		4	6	2	2	4	
						People on boat % Boats Fishing	75%	80%	0%	10%	25%		90%	90%	10%	20%	50%	
thur	1	24	12	1	1	5	54	48	0	0	4	106	86	65	0	0	10	162
fri	2	13	6	1	1	8	29	24	0	0	6	59	47	32	0	0	16	96
sat	3	130	58	0	1	44	293	232	0	0	33	558	468	313	0	0	88	870
sun	4	67	42	2	7	22	151	168	0	1	17	336	241	227	0	3	44	515
mon	5	12	7	0	1	5	27	28	0	0	4	59	43	38	0	0	10	91
tue	6	41	27	4	1	9	92	108	0	0	7	207	148	146	1	0	18	313
wed	7	7	3	0	0	5	16	12	0	0	4	32	25	16	0	0	10	51
thu	8	9	9	3	1	11	20	36	0	0	8	65	32	49	1	0	22	104
fri	9	130	36	0	0	16	293	144	0	0	12	449	468	194	0	0	32	694
sat	10	23	14	0	0	13	52	56	0	0	10	118	83	76	0	0	26	184
sun	11	39	33	0	1	19	88	132	0	0	14	234	140	178	0	0	38	357
mon	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tue	13	0	8	1	0	0	0	32	0	0	0	32	0	43	0	0	0	43
wed	14	40	13	0	3	10	90	52	0	0	8	150	144	70	0	1	20	235
thu	15	15	19	0	0	0	34	76	0	0	0	110	54	103	0	0	0	157
fri	16	1	4	1	0	0	2	16	0	0	0	18	4	22	0	0	0	25
sat	17	7	5	0	0	10	16	20	0	0	8	43	25	27	0	0	20	72
sun	18	33	34	0	1	2	74	136	0	0	2	212	119	184	0	0	4	307
mon	19	21	28	1	1	5	47	112	0	0	4	163	76	151	0	0	10	237
tue	20	25	32	0	3	3	56	128	0	0	2	187	90	173	0	1	6	270
wed	21	47	30	0	4	9	105	122	0	0	7	234	169	165	0	2	17	352
thu	22	25	22	2	2	2	56	88	0	0	2	146	90	119	0	1	4	214
fri	23	10	17	0	0	0	23	68	0	0	0	91	36	92	0	0	0	128
sat	24	70	41	1	1	2	158	164	0	0	2	323	252	221	0	0	4	478
sun	25	0	1	1	1	0	0	4	0	0	0	4	0	5	0	0	0	6
mon	26	3	9	2	0	0	7	36	0	0	0	43	11	49	0	0	0	60
tue	27	11	3	1	0	2	25	12	0	0	2	38	40	16	0	0	4	60
wed	28	13	24	0	0	1	29	96	0	0	1	126	47	130	0	0	2	178
thu	29	2	3	0	2	0	5	12	0	0	0	17	7	16	0	1	0	24
fri	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
sat	31	1	7	0	1	0	0	2	28	0	0	30	4	38	0	0	0	42



# November 2020

Day	Date	Vessels					People on boat	People Low					Low Sub	People High					High Sub
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)		Small/Me d	Large	Sail	Maybes	Small/Me d S		Small/Me d	Large	Sail	Maybes	Small/Me d S	
							3	5	1	1	3		4	6	2	2	4		
							% Boats Fishing	75%	80%	0%	10%	25%		90%	90%	10%	20%	50%	
sun	1	2	4	0	0	0		5	16	0	0	0	21	7	22	0	0	0	29
mon	2	0	1	0	0	0		0	4	0	0	0	4	0	5	0	0	0	5
tue	3	2	2	5	2	0		5	8	0	0	0	13	7	11	1	1	0	20
wed	4	26	19	3	0	4		59	76	0	0	3	138	94	103	1	0	8	205
thu	5	53	30	3	3	8		119	120	0	0	6	246	191	162	1	1	16	371
fri	6	64	28	3	0	0		144	112	0	0	0	256	230	151	1	0	0	382
sat	7	126	43	0	3	14		285	172	0	0	11	467	455	232	0	1	28	717
sun	8	94	34	1	3	11		212	136	0	0	8	356	338	184	0	1	22	545
mon	9	51	17	2	2	5		115	68	0	0	4	187	184	92	0	1	10	287
tue	10	35	16	1	2	4		79	64	0	0	3	146	126	86	0	1	8	221
wed	11	2	2	1	0	0		5	8	0	0	0	13	7	11	0	0	0	18
thu	12	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
fri	13	5	4	3	2	0		11	16	0	0	0	27	18	22	1	1	0	41
sat	14	20	18	2	0	6		45	72	0	0	5	122	72	97	0	0	12	182
sun	15	1	0	0	0	0		2	0	0	0	0	2	4	0	0	0	0	4
mon	16	1	1	0	0	0		2	4	0	0	0	6	4	5	0	0	0	9
tue	17	1	1	0	0	0		2	4	0	0	0	6	4	5	0	0	0	9
wed	18	5	0	0	0	0		11	0	0	0	0	11	18	0	0	0	0	18
thu	19	12	19	0	2	0		27	76	0	0	0	103	43	103	0	1	0	147
fri	20	3	3	0	0	0		7	12	0	0	0	19	11	16	0	0	0	27
sat	21	3	1	0	0	0		7	4	0	0	0	11	11	5	0	0	0	16
sun	22	1	6	0	2	0		2	24	0	0	0	26	4	32	0	1	0	37
mon	23	1	0	0	2	0		2	0	0	0	0	2	4	0	0	1	0	4
tue	24	11	4	2	0	0		25	16	0	0	0	41	40	22	0	0	0	62
wed	25	7	6	0	1	0		16	24	0	0	0	40	25	32	0	0	0	58
thu	26	1	0	0	0	0		2	0	0	0	0	2	4	0	0	0	0	4
fri	27	57	14	1	1	1		128	56	0	0	1	185	205	76	0	0	2	283
sat	28	32	16	1	1	4		72	64	0	0	3	139	115	86	0	0	8	210
sun	29	45	13	0	0	6		101	52	0	0	5	158	162	70	0	0	12	244
mon	30	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0

# December 2020

Day	Date	Vessels					Small/Me d S (right axis)	People Low					Low Sub	People High					High Sub	
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)		Small/Me d	Large	Sail	Maybes	Small/Me d S		Small/Me d	Large	Sail	Maybes	Small/Me d S		
							People on boat	3	5	1	1	3		4	6	2	2	4		
							% Boats Fishing	75%	80%	0%	10%	25%		90%	90%	10%	20%	50%		
tue	1	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
wed	2	1	1	2	0	0		2	4	0	0	0	6	4	5	0	0	0	0	9
thu	3	13	16	2	2	1		29	64	0	0	1	94	47	86	0	1	2	136	
fri	4	4	2	0	1	0		9	8	0	0	0	17	14	11	0	0	0	26	
sat	5	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
sun	6	5	2	0	0	0		11	8	0	0	0	19	18	11	0	0	0	29	
mon	7	6	5	0	1	1		14	20	0	0	1	34	22	27	0	0	2	51	
tue	8	0	2	0	0	0		0	8	0	0	0	8	0	11	0	0	0	11	
wed	9	2	8	0	0	0		5	32	0	0	0	37	7	43	0	0	0	50	
thu	10	18	11	0	1	3		41	44	0	0	2	87	65	59	0	0	6	131	
fri	11	31	10	0	1	1		70	40	0	0	1	111	112	54	0	0	2	168	
sat	12	26	5	0	0	1		59	20	0	0	1	79	94	27	0	0	2	123	
sun	13	29	4	0	0	0		65	16	0	0	0	81	104	22	0	0	0	126	
mon	14	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
tue	15	0	1	1	2	0		0	4	0	0	0	4	0	5	0	1	0	6	
wed	16	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
thu	17	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
fri	18	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
sat	19	37	7	0	0	2		83	28	0	0	2	113	133	38	0	0	4	175	
sun	20	13	4	0	0	2		29	16	0	0	2	47	47	22	0	0	4	72	
mon	21	12	8	0	0	0		27	32	0	0	0	59	43	43	0	0	0	86	
tue	22	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
wed	23	41	2	0	0	1		92	8	0	0	1	101	148	11	0	0	2	160	
thu	24	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
fri	25	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
sat	26	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
sun	27	47	5	0	0	1		106	20	0	0	1	127	169	27	0	0	2	198	
mon	28	5	3	0	1	0		11	12	0	0	0	23	18	16	0	0	0	35	
tue	29	1	2	0	0	0		2	8	0	0	0	10	4	11	0	0	0	14	
wed	30	24	1	0	0	1		54	4	0	0	1	59	86	5	0	0	2	94	
thu	31	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	

# September 2021

Day	Date	Vessels					People Low						People High					
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)	Small/Me d	Large	Sail	Maybes	Small/Me d S	Low Sub	Small/Me d	Large	Sail	Maybes	Small/Me d S	High Sub
							3	5	1	1	3		4	6	2	2	4	
						People on boat % Boats Fishing	67.5%	85%	0%	15%	25%		85%	92.5%	10%	25%	50%	
wed	1	5	11	1	1	3	10	47	0	0	2	59	17	61	0	1	6	85
thu	2	2	35	1	1	6	4	149	0	0	5	157	7	194	0	1	12	214
fri	3	30	41	2	2	7	61	174	0	0	5	241	102	228	0	1	14	345
sat	4	421	88	2	5	18	853	374	0	1	14	1241	1431	488	0	3	36	1959
sun	5	54	45	1	0	22	109	191	0	0	17	317	184	250	0	0	44	478
mon	6	147	121	0	9	36	298	514	0	1	27	840	500	672	0	5	72	1248
tue	7	148	68	0	2	18	300	289	0	0	14	603	503	377	0	1	36	918
wed	8	7	20	0	1	8	14	85	0	0	6	105	24	111	0	1	16	151
thu	9	0	19	0	1	3	0	81	0	0	2	83	0	105	0	1	6	112
fri	10	1	53	0	1	5	2	225	0	0	4	231	3	294	0	1	10	308
sat	11	147	37	0	0	1	298	157	0	0	1	456	500	205	0	0	2	707
sun	12	23	0	0	0	0	47	0	0	0	0	47	78	0	0	0	0	78
mon	13	43	14	2	0	1	87	60	0	0	1	147	146	78	0	0	2	226
tue	14	137	17	0	2	0	277	72	0	0	0	350	466	94	0	1	0	561
wed	15	10	0	2	0	0	20	0	0	0	0	20	34	0	0	0	0	34
thu	16	50	42	0	0	6	101	179	0	0	5	284	170	233	0	0	12	415
fri	17	0	80	0	0	2	0	340	0	0	2	342	0	444	0	0	4	448
sat	18	19	0	0	0	1	38	0	0	0	1	39	65	0	0	0	2	67
sun	19	43	0	0	0	0	87	0	0	0	0	87	146	0	0	0	0	146
mon	20	11	0	0	0	0	22	0	0	0	0	22	37	0	0	0	0	37
tue	21	13	0	0	0	0	26	0	0	0	0	26	44	0	0	0	0	44
wed	22	9	0	0	0	0	18	0	0	0	0	18	31	0	0	0	0	31
thu	23	0	14	0	4	7	0	60	0	1	5	65	0	78	0	2	14	94
fri	24	1	43	0	0	5	2	183	0	0	4	189	3	239	0	0	10	252
sat	25	137	88	1	3	12	277	374	0	0	9	661	466	488	0	2	24	980
sun	26	29	74	1	0	12	59	315	0	0	9	382	99	411	0	0	24	534
mon	27	27	63	1	2	18	55	267	0	0	14	336	92	349	0	1	36	478
tue	28	20	23	1	2	6	41	98	0	0	5	143	68	128	0	1	12	209
wed	29	3	8	0	1	2	6	34	0	0	2	42	10	44	0	1	4	59
thu	30	45	30	2	2	5	91	128	0	0	4	223	153	167	0	1	10	331

# October 2021

Day	Date	Vessels						People Low						People High					
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)	People on boat	Small/Me d	Large	Sail	Maybes	Small/Me d S	Low Sub	Small/Me d	Large	Sail	Maybes	Small/Me d S	High Sub
							3	5	1	1	3		4	6	2	2	4		
							% Boats Fishing	75%	80%	0%	10%	25%		90%	90%	10%	20%	50%	
fri	1	61	36	1	2	4		137	144	0	0	3	284	220	194	0	1	8	423
sat	2	180	63	0	5	4		405	252	0	1	3	661	648	340	0	2	8	998
sun	3	39	12	0	7	4		88	48	0	1	3	139	140	65	0	3	8	216
mon	4	11	5	2	2	0		25	20	0	0	0	45	40	27	0	1	0	68
tue	5	71	30	2	3	2		160	120	0	0	2	282	256	162	0	1	4	423
wed	6	2	18	1	4	1		5	72	0	0	1	78	7	97	0	2	2	108
thu	7	14	15	3	1	3		32	60	0	0	2	94	50	81	1	0	6	138
fri	8	49	31	0	2	6		110	124	0	0	5	239	176	167	0	1	12	357
sat	9	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sun	10	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
mon	11	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
tue	12	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
wed	13	12	21	1	1	3		27	84	0	0	2	113	43	113	0	0	6	163
thu	14	78	35	3	4	12		176	141	0	0	9	327	282	190	1	2	24	499
fri	15	223	60	1	6	10		502	240	0	1	8	750	803	324	0	2	20	1,149
sat	16	7	13	0	3	0		16	52	0	0	0	68	25	70	0	1	0	97
sun	17	7	5	1	3	4		16	20	0	0	3	39	25	27	0	1	8	62
mon	18	2	1	0	3	2		5	4	0	0	2	10	7	5	0	1	4	18
tue	19	1	6	1	8	5		2	24	0	1	4	31	4	32	0	3	10	49
wed	20	30	26	1	5	4		68	104	0	1	3	175	108	140	0	2	8	259
thu	21	5	23	0	5	1		11	92	0	1	1	105	18	124	0	2	2	146
fri	22	18	10	2	3	4		41	40	0	0	3	84	65	54	0	1	8	128
sat	23	115	35	0	5	19		259	140	0	1	14	414	414	189	0	2	38	643
sun	24	103	36	1	4	4		232	144	0	0	3	379	371	194	0	2	8	575
mon	25	3	8	0	1	0		7	32	0	0	0	39	11	43	0	0	0	54
tue	26	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
wed	27	0	2	3	0	2		0	8	0	0	2	10	0	11	1	0	4	15
thu	28	0	2	2	1	0		0	8	0	0	0	8	0	11	0	0	0	12
fri	29	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sat	30	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sun	31	4	6	2	0	2		9	24	0	0	2	35	14	32	0	0	4	51

# November 2021

Day	Date	Vessels					People on boat	People Low					Low Sub	People High					High Sub
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)		Small/Me d	Large	Sail	Maybes	Small/Me d S		Small/Me d	Large	Sail	Maybes	Small/Me d S	
							3	5	1	1	3		4	6	2	2	4		
							% Boats Fishing	75%	80%	0%	10%	25%		90%	90%	10%	20%	50%	
mon	1	11	15	2	2	1		25	60	0	0	1	86	40	81	0	1	2	124
tue	2	58	22	1	7	5		131	88	0	1	4	223	209	119	0	3	10	341
wed	3	8	12	0	5	0		18	48	0	1	0	67	29	65	0	2	0	96
thu	4	17	6	1	3	3		38	24	0	0	2	65	61	32	0	1	6	101
fri	5	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sat	6	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sun	7	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
mon	8	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
tue	9	16	10	0	0	1		36	40	0	0	1	77	58	54	0	0	2	114
wed	10	29	22	0	4	6		65	88	0	0	5	158	104	119	0	2	12	237
thu	11	15	14	0	4	0		34	56	0	0	0	90	54	76	0	2	0	131
fri	12	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sat	13	3	8	0	0	0		7	32	0	0	0	39	11	43	0	0	0	54
sun	14	14	7	1	3	4		32	28	0	0	3	63	50	38	0	1	8	98
mon	15	1	2	0	3	0		2	8	0	0	0	11	4	11	0	1	0	16
tue	16	4	10	0	3	2		9	40	0	0	2	51	14	54	0	1	4	74
wed	17	27	6	0	4	0		61	24	0	0	0	85	97	32	0	2	0	131
thu	18	0	1	0	3	0		0	4	0	0	0	4	0	5	0	1	0	7
fri	19	0	0	1	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sat	20	25	11	1	0	4		56	44	0	0	3	103	90	59	0	0	8	158
sun	21	44	15	2	5	2		99	60	0	1	2	161	158	81	0	2	4	246
mon	22	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
tue	23	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
wed	24	0	1	0	0	1		0	4	0	0	1	5	0	5	0	0	2	7
thu	25	6	0	0	1	0		14	0	0	0	0	14	22	0	0	0	0	22
fri	26	1	0	0	0	0		2	0	0	0	0	2	4	0	0	0	0	4
sat	27	3	0	3	1	0		7	0	0	0	0	7	11	0	1	0	0	12
sun	28	14	4	1	2	2		32	16	0	0	2	49	50	22	0	1	4	77
mon	29	2	0	0	0	0		5	0	0	0	0	5	7	0	0	0	0	7
tue	30	1	2	0	1	0		2	8	0	0	0	10	4	11	0	0	0	15

December 2021

Day	Date	Vessels					People on boat	People Low					Low Sub	People High					High Sub
		Small/Me d (Left Axis)	Large (right axis)	Sail	Maybes	Small/Me d S (right axis)		Small/Me d	Large	Sail	Maybes	Small/Me d S		Small/Me d	Large	Sail	Maybes	Small/Me d S	
							3	5	1	1	3		4	6	2	2	4		
							% Boats Fishing	75%	80%	0%	10%	25%		90%	90%	10%	20%	50%	
wed	1	21	10	0	2	0		47	40	0	0	0	87	76	54	0	1	0	130
thu	2	2	1	0	0	0		5	4	0	0	0	9	7	5	0	0	0	13
fri	3	2	1	2	3	0		5	4	0	0	0	9	7	5	0	1	0	14
sat	4	37	8	0	0	2		83	32	0	0	2	117	133	43	0	0	4	180
sun	5	5	4	1	0	0		11	16	0	0	0	27	18	22	0	0	0	40
mon	6	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
tue	7	4	4	1	0	0		9	16	0	0	0	25	14	22	0	0	0	36
wed	8	4	2	0	0	0		9	8	0	0	0	17	14	11	0	0	0	25
thu	9	5	2	1	0	0		11	8	0	0	0	19	18	11	0	0	0	29
fri	10	14	2	0	1	0		32	8	0	0	0	40	50	11	0	0	0	62
sat	11	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sun	12	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
mon	13	7	10	0	0	0		16	40	0	0	0	56	25	54	0	0	0	79
tue	14	15	2	0	0	1		34	8	0	0	1	43	54	11	0	0	2	67
wed	15	4	8	3	0	0		9	32	0	0	0	41	14	43	1	0	0	58
thu	16	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
fri	17	20	2	0	3	0		45	8	0	0	0	53	72	11	0	1	0	84
sat	18	26	4	0	0	2		59	16	0	0	2	76	94	22	0	0	4	119
sun	19	0	1	0	0	0		0	4	0	0	0	4	0	5	0	0	0	5
mon	20	3	2	1	0	1		7	8	0	0	1	16	11	11	0	0	2	24
tue	21	18	4	0	0	0		41	16	0	0	0	57	65	22	0	0	0	86
wed	22	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
thu	23	1	0	0	0	0		2	0	0	0	0	2	4	0	0	0	0	4
fri	24	7	0	0	0	0		16	0	0	0	0	16	25	0	0	0	0	25
sat	25	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
sun	26	14	0	0	0	1		32	0	0	0	1	32	50	0	0	0	2	52
mon	27	12	0	1	0	0		27	0	0	0	0	27	43	0	0	0	0	43
tue	28	32	1	0	0	2		72	4	0	0	2	78	115	5	0	0	4	125
wed	29	20	4	0	0	1		45	16	0	0	1	62	72	22	0	0	2	96
thu	30	29	3	0	0	0		65	12	0	0	0	77	104	16	0	0	0	121
fri	31	73	3	0	0	1		164	12	0	0	1	177	263	16	0	0	2	281