Draft Project Plan – Ocean City, Maryland: Inlet Video Monitoring of Recreational Effort

**The issue…**

The mail-based Fishing Effort Survey (FES[1]) is run by NOAA Fisheries' Marine Recreational Information Program (MRIP), and was fully implemented in 2018 after being successfully peer-reviewed and determined to address many of the issues identified with its predecessor phone-based survey[2]. All indications are that the current methods are superior, but concerns remain about the higher magnitude of angler effort estimates being produced by FES. Since effort is one component of catch estimates, the concerns naturally extend to MRIP catch estimates.

Council staff previously conducted a back-of-envelope "thought experiment" to superficially evaluate the reasonableness of the new/current estimates, which suggested that they may not necessarily be infeasible given the overall population in the Mid-Atlantic (pdf page 10: http://www.mafmc.org/s/Tab14_ExecutiveDirectorsReport_2018-10.pdf). Staff has continued to contemplate an independent way to estimate effort for comparison purposes, at least in terms of general magnitude, leading to this project. It is important to note that if this project results in different effort estimates than MRIP it wouldn't necessarily mean that MRIP estimates are "wrong," just that more investigation would be appropriate to determine the source of the differences. Also, various assumptions (discussed below) are going to have to be made with this project, and each assumption will introduce uncertainty. Rather than producing a single effort estimate, this project will aim to develop plausible ranges for those assumptions and produce a plausible range of effort estimates.

**The opportunity…**

Nearly all ocean effort in Maryland must use the Ocean City, MD Inlet. The Maryland Chesapeake Bay ports nearest the ocean are Smith Island, MD or Crisfield, MD, which are approximately 60 miles from the ocean. There are several Maryland landings/ramps on Chincoteague Bay (George Island Landing, Taylor Landing) but they are 13 or more miles from the ocean inlet near Chincoteague, VA and require using the drawbridge at Chincoteague as well as transiting a slow no wake zone near Chincoteague. These sites are small, lightly used, and the few MRIP intercepts at them indicate they are used for inland trips. There are some private household docks near Snow Hill, MD, but they are over 20 miles from the Chincoteague Inlet and also unlikely to contribute to a substantial number of ocean trips originating from Maryland but using the Chincoteague, VA inlet. In short, the geography (both natural and human) means that if not all, nearly all ocean effort originating from Maryland traverses the inlet at Ocean City, MD.

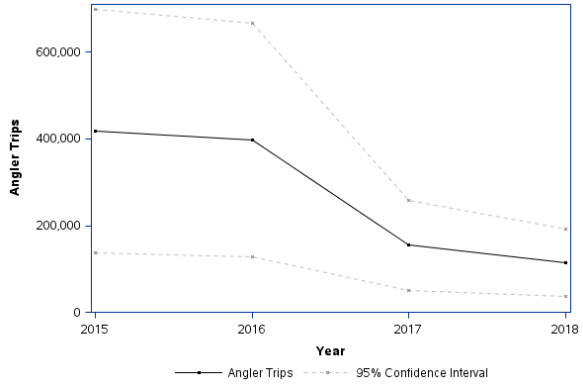
MRIP estimates that over 2015-2018 (when MRIP effort estimates are largely based on the FES versus calibrations of earlier data) around 110,000 to 420,000 Maryland ocean private/rental boat angler trips were taken annually, with proportional standard errors (PSE) ranging around 34-35 (see Figure 1 below).

[1] https://www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements, https://www.fisheries.noaa.gov/webdam/download/87655896, https://www.fisheries.noaa.gov/webdam/download/77001942

[2] https://www.nap.edu/read/24640/chapter/5#44

PSE expresses the standard error of an estimate as a percentage of the estimate and is a measure of precision. A PSE value greater than 50 indicates a very imprecise estimate, and PSEs of 34-35 indicate that there is substantial uncertainty, as illustrated by the 95% confidence intervals. The uncertainty described from these confidence intervals is due to the sample sizes and variability of both the data obtained through the FES, which gets total Maryland effort for private/rental boats, and the Access Point Angler Intercept Survey (APAIS), which is used to apportion total effort among inland and ocean locations. It would be preferable to have a more precise MRIP estimate from which to make comparisons to, but staff is not aware of other east coast locations that allow equally simple video monitoring.

Figure 1. Maryland Private/Rental Boat Angler Trips, All Ocean Combined




The geographic happenstance of ocean access from Maryland potentially allows for the use of video-based effort estimation to create an estimate of effort that is mostly independent from MRIP for comparison. Secondary goals, depending on time, resources, and project results, could include: confirming the assumed negligible January/February ocean effort from Maryland and comparing a video-based for hire effort estimate to other data (vessel trip reports/logbooks or MRIP). Depending on the results of this pilot project, it is conceivable that a method could be developed to use a video count system as an alternative method for generation of ocean fishing effort estimates from Maryland.

**Methods…**

This approach was inspired by methods that were developed and implemented through the MRIP process, and are in use in Oregon[3].

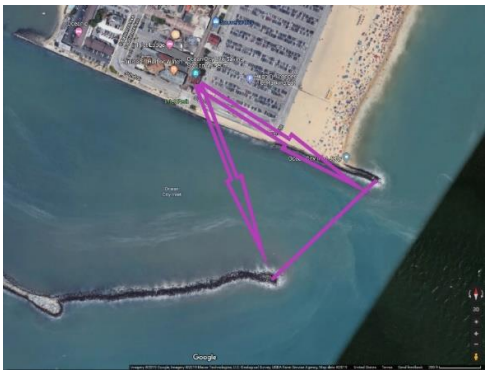
A video camera will be mounted on the Ocean City lifesaving station tower or nearby location, and angled/zoomed to provide the best possible view of the inlet threshold. Ocean City has approved installation of a camera. There is an equipment shed onsite that stores other computer equipment, and a DVR will be connected to the camera. The DVR will be connected to the internet, allowing remote viewing of video and DVR management. The goal would be to start recordings on January 1, 2020. This would allow IT troubleshooting before Wave 2 begins March 1, and also potentially allow evaluation of

[3] https://www.dfw.state.or.us/MRP/salmon/docs/ORBS_Design.pdf

Wave 1 activity when MRIP does not operate in Maryland. Also, the time/cost of video review during low activity periods is relatively low (most of the recording can be viewed in fast-forward mode).

A reviewer will take counts of potential recreational fishing vessels that cross a threshold set as a line connecting the east tips of the north and south jetties at the Ocean City, MD inlet, which is also the dividing line for MRIP trips (Figure 2). Council staff has been discussing optimal reviewer identification with Maryland staff.

Figure 2. Ocean City, Maryland Inlet



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It will likely be impossible to completely disentangle the private and for-hire effort for some vessels. However, most for-hire vessels fishing in the ocean will also need to report their trip either on federal VTRs or MD state logbooks, so deducting those trips should provide an approximate way to estimate just private/rental trips from the total. The MRIP for-hire survey could also be used to deduct for-hire effort from the total count.

There will be some “non-fishy” pleasure craft that fish, and some fishing vessels that aren’t fishing. Staff will host an evening workshop in the Ocean City, MD area with local captains (several have agreed to participate) and the reviewer to view some actual video from the project and finalize a methodology to bin different vessel types into fishing/maybe fishing/non-fishing counts before any final counts from the video are begun. A second workshop would occur later in the year as a check that binning has remained consistent.

While the MRIP estimates are “angler trips,” the estimates from the video survey are most likely to be “vessels.” It is possible that for many smaller vessels the number of anglers can be counted. The project will explore several ways to convert the viewed vessels to “angler trips,” also using the workshop for local input. While the general goal is to avoid using MRIP data in order to develop an independent estimate, it may be that MRIP Access Point Angler Intercept Survey data will be the best source of data on average anglers per trip (or can be used in combination with the workshop).

The distribution of total MRIP FES trips between inland or ocean location is made based on data from the Access Point Angler Intercept Survey (APAIS). During APAIS interviews, anglers are asked where they “mostly” fished. Since the video system will only be able to count all vessels that entered the ocean, this aspect will tend to make the video count somewhat higher than the MRIP count; the video count will also include some vessels that partly fished in the ocean but mostly fished in the back bays.

It is not yet certain to what degree vessels will be able to be counted at night (that is part of the pilot aspect of this project). The cameras being considered do have good nighttime (IR) capabilities, but nearby parking lights may interfere with the camera's sensors. Staff is investigating several options. If vessels can be identified at night, then they will be simply counted. If they cannot be reliably detected at night via video, then some kind of extrapolation will need to occur. Options include using local knowledge gained through the workshop, APAIS data (which includes time of interview [landing] and time on the water), adding some on-site in-person sampling to estimate the ratio of vessels that traverse the inlet in the dark, or using data from moonlit nights to create an extrapolation factor for nights when there is insufficient light. Or all of the above will be used to create a range of plausible expansion factors. In general, it is hoped and anticipated that vessels will be able to be simply counted at night.

There will likely be some days when fog completely obscures the view of the inlet's ocean threshold. This will be another topic for the planned workshop. Preliminary considerations include using similar nearby usable days with a penalty based on the fog and a sea-state adjustment factor (there is a USACE buoy that measures wave data about a mile NE of the inlet).

The final product of the project will be a range of likely effort estimates based on the video count and the various assumptions/adjustments described above.