

Final Report  
Continuation of the *iSnapper* smartphone fisheries data collection “app” in Texas  
Contract: CA-0001365  
10/18/2022

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## **I. Background**

In 2015, with funding from NOAA’s Marine Recreational Information Program, the Harte Research Institute (HRI) and Texas Parks and Wildlife (TPWD) successfully released *iSnapper*, an application (“app”) to collect self-reported catch and effort data from private recreational anglers in Texas, primarily targeting Red Snapper anglers. This app was initially piloted in 2011 for use in the charter-for-hire fleet but was then modified for use in the entire recreational sector. Since 2015, *iSnapper* has been available to recreational anglers every year and has been an informative supplemental data source for TPWD to compare to their own landings estimates. One of the benefits of *iSnapper* is the ability for anglers to report their catch without being intercepted by a creel agent. In many cases throughout the state, anglers have private dock access (their primary or sometimes secondary residences) or are arriving back to the boat ramp after traditional creel surveys end (18:00). With *iSnapper*, these anglers can submit their trips and have their data be included in the effort and harvest estimates. Due to the importance and utility of this supplemental data, TPWD agreed to continue the *iSnapper* project for fiscal years 2021 and 2022. Similar to previous years, creel data collected by both TPWD and 3 temporary summer technicians hired through HRI was compiled and analyzed to determine reporting and validation rates. These rates were then used along with the creel and self-reported data to ultimately calculate the effort (angler-trips) and harvest (lbs or numbers of fish) for the time periods.

## **II. Tasks Completed**

Three creel agents were hired through HRI to assist with the increased sampling of Gulf-only locations during the federal season which opened on June 1<sup>st</sup> every year and closed on August 4<sup>th</sup> in 2021 and September 2<sup>nd</sup> in 2022. Each year, one individual was located in Galveston and assigned to conduct the northern creels (Sabine- Port O’Connor), and the other two individuals were located in Corpus Christi and assigned to cover the mid and southern creels (Matagorda – Port Mansfield). While TPWD interviews all anglers, these additional hires were specifically targeting Red Snapper anglers (based on boat size, fishing tackle, and direct questioning). All creel data of Red Snapper effort collected by TPWD and HRI were recorded and used in

calculating harvest estimates for Red Snapper. In addition, all *iSnapper* trips submitted with the app and using the web portal were compared to the creel data to determine which trips had been validated- wherein an angler was creeled at a boat ramp and input the trip using *iSnapper*. The reporting rate was calculated by taking the number of validated trips and dividing it by the number of creel surveys during that time.

Regarding outreach, wallet cards featuring the utility and importance of *iSnapper* were distributed to anglers during creel surveys. In addition, various social media outlets including Facebook and Twitter were utilized to try and encourage anglers to use the app. We also posted a thread talking about the app and its importance on to several of the well-known fishing forums, where several thousand members read each post.

For 2021, the estimated annual harvest was 41,804 (SE 25,744) Red Snapper for a total weight of 268,631 lbs (SE 170,033, Table 1). To calculate the total pounds harvested, creel data from TPWD where lengths were recorded were converted to grams based on the following conversion calculation  $0.000005242 * (\text{length}^{3.145})$ , then converted to pounds for ease of comparison to the annual quota (which is reported in pounds). In addition, we estimated 22,912 angler-trips, equating to a harvest of 1.82 fish per angler. Results from 2022 include landings through September and are highly variable due to validation constraints. The estimated annual harvest was 126,126 (SE 123,295) Red Snapper harvested for a total weight of 689,575 lbs (SE 479,824). Similarly, the estimate of 78,006 angler-trips was far higher than estimated in years passed.

In all previous years, we have been able to encounter multiple *iSnapper* users, and therefore our estimates have been more accurate. However, despite our 3 HRI-hired summer creel agents and all the TPWD creel effort, only one trip was validated during the entire 2022 federal season. This lack of validation caused landings estimates to be much higher than anticipated and highly variable. While we knew encountering *iSnapper* users was important, these results demonstrated that accurate estimates depend on multiple trip validations. This might be something for TPWD to consider in the future; if anglers are not reporting in *iSnapper* and harvest estimates using the app are going to be used to help inform management decisions, it might be worth doing additional targeted creels at high-use sites where *iSnapper* users are likely to frequent.

The CPUE for 2022 through September was 1.69 fish per angler, which is notably less than in previous years. Despite the inflated catch estimates due to a lack of validation, we believe the decrease in CPUE was a legitimate change based on staff field observations as well as several discussions with avid offshore anglers. To investigate this further we estimated the recreational CPUE based on creel survey data for June and July. *iSnapper* creel data collection began in 2015, however due to varied federal seasons lengths, data comparisons started in 2017 for June and 2018 for July, so an entire months' worth of data could be examined. While the number of Red Snapper harvested in June was highly variable depending on year, the CPUE has remained fairly consistent (1.66 – 1.88 Red Snapper per angler, Figure 2). Similarly, the July CPUE ranges from 1.69 – 1.81 Red Snapper per angler) however in July, there is also a negative correlation ( $y = -0.0158x + 1.7935$ ,  $R^2 = 0.2164$ ) for the CPUE over time and a strong negative correlation for

the number harvested over time ( $y = -477.9x + 3619.9$ ,  $R^2 = 0.5121$ ; Figure 3). While the quota is based on the harvested weight, it is calculated by estimating the number of Red Snapper harvested and then converting that number into a total weight. While the decrease observed in the number harvested is confounded by the number of anglers (due to there being a bag limit for this species) this downward trend is worth noting. When examining angler effort over time (angler-trips in July each year), there was a significant decrease in 2022 (Figure 4). With the average cost of gas in Texas at \$4.07/gal this past July, as compared to ~\$2.41/gal during the previous years, it is possible that less people were able to afford to go fishing offshore.

### **III. Status of Tasks in Progress**

All data collection and calculations have been completed, with this being the final report for the *iSnapper* project. Estimates were calculated for the entire 2021 calendar year and from January through September for 2022. Despite the contract terminating at fiscal year end, we felt it was important to include as much data as possible into the harvest and effort estimates, which led us to provide the 2022 estimates for an additional month. This being the case and with the federal season closing September 2<sup>nd</sup>, we do not anticipate a significant number of additional Red Snapper state water trips, so the estimate for 2022 is not likely to increase a substantial amount between now and the end of the year. Based on creel data from the last 7 years, landings occurring during the fall/winter months only account for approximately 5% of the total annual harvest.

### **IV. iSnapper Integration with TPWD's Outdoor Annual**

TPWD has always been a strong supporting partner (and in some cases such as these last two years also a funding source) of the *iSnapper* project since 2015, when the app was released for use by both private and for-hire Red Snapper anglers. Since then, we have incorporated their creel data with our own supplemental creel data and used them along with the electronically reported *iSnapper* data to estimate the total annual Red Snapper harvest and effort. In recent years, TPWD has discussed the potential to integrate *iSnapper* in *My Texas Hunt Harvest*, an electronic data collection app provided by TPWD that can be found within the *Outdoor Annual* app. Currently, *My Texas Hunt Harvest* only allows anglers to report their harvest of alligator gar and oversized Red Drum. There are plans to expand the app to include more species, and Red Snapper has been one in consideration. Since *iSnapper* has already been created for this fishing sector, it would be relatively easy to incorporate either the app itself or a similarly designed data collection option for this species into the app with the reporting being either voluntary or mandatory. Since TPWD has been using their creel survey data for harvest estimation for almost 50 years, it is likely that this new reporting system will be in addition to the standard creel survey. Our group is currently serving in an advisory capacity to help with the planning of this next phase of *My Texas Hunt Harvest*.

## **V. Adherence to Project Timeline**

### **A. Anticipated Delays**

No delays occurred during the project and all reports and harvest estimates were provided in a timely manner.

## VI. Tables and Figures

Table 1. Annual effort and harvest data for private recreational Red Snapper anglers calculated using *iSnapper* and TPWD's creel survey.

Method	Number Harvested	Weight (lbs)	Angler-Trips	Fish per Angler-trip	Reporting Rates	Season Length
<i>iSnapper</i> 2022 (thru Sept)	126,126 (SE 123,295)	690,703 (SE 480,551)	78,006	1.617	0.30%	94 days
TPWD		115,108				
<i>iSnapper</i> 2021	41,804 (SE 25,744)	268,631 (SE 170,033)	22,912	1.825	0.5%	65 days
TPWD 2021		211,373				
<i>iSnapper</i> 2020	77,096 (SE 31,987)	479,074 (SE 208,455)	41,664	1.850	1.02%	63 days
TPWD 2020						
<i>iSnapper</i> 2019	50,464 (SE 23,420)	271,540 (SE 90,112)	27,261	1.851	2.16%	62 days
TPWD 2019	67,643 (SE 17,224)	339,023 (SE 86,404)	27,112	2.495		
<i>iSnapper</i> 2018	66,136 (SE 12,925)	353,364 (SE 74,581)	35,872	1.844	3.97%	82 days
TPWD 2018	32,330	182,021	15,480	2.089		
<i>iSnapper</i> 2017	71,883 (SE 31,042)	379,667 (SE 171,681)	36,530	1.968	2.53%	42 days
TPWD 2017	36,389 (SE 9,004)	196,270 (SE 49,643)	17,652	2.061		
<i>iSnapper</i> 2016	55,062 (SE 31,610)	278,636 (SE 165,437)	27,825	1.979	3.56%	11 days
TPWD 2016	22,328 (SE 6,370)	112,164 (SE 35,320)	11,158	2.001		
<i>iSnapper</i> 2015	58,251 (SE 25,344)	272,564 (SE 126,966)	23,358	2.494	4.28%	9 days
TPWD 2015	32,329 (SE 6,496)	154,562 (SE 32,830)	11,154	2.898		

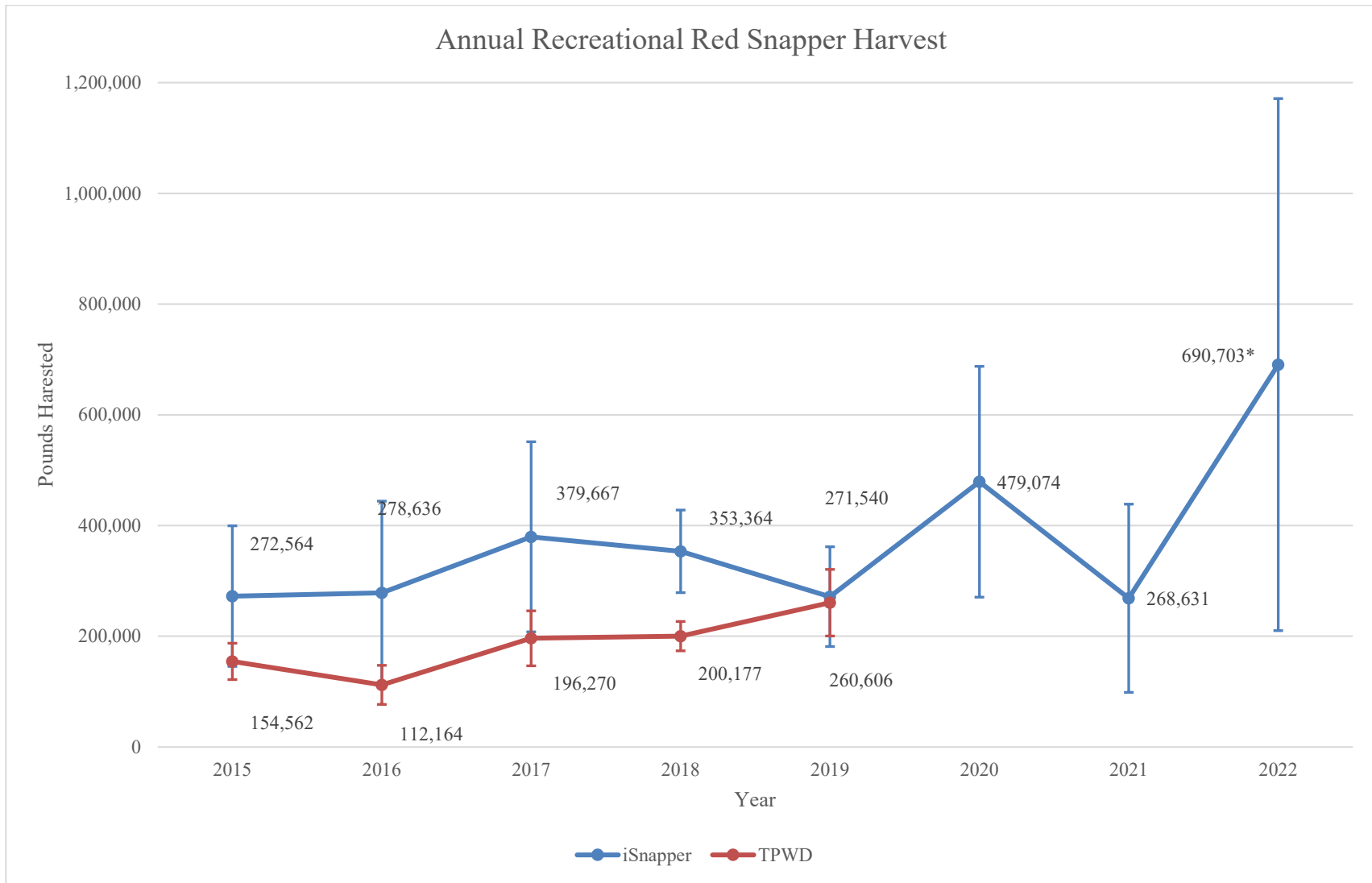


Figure 1. Harvest estimates (in pounds) of recreational anglers for *iSnapper* (blue) and TPWD (red) since 2015. \*Estimates for 2022 are from January 1<sup>st</sup> through Sept 30<sup>th</sup>.

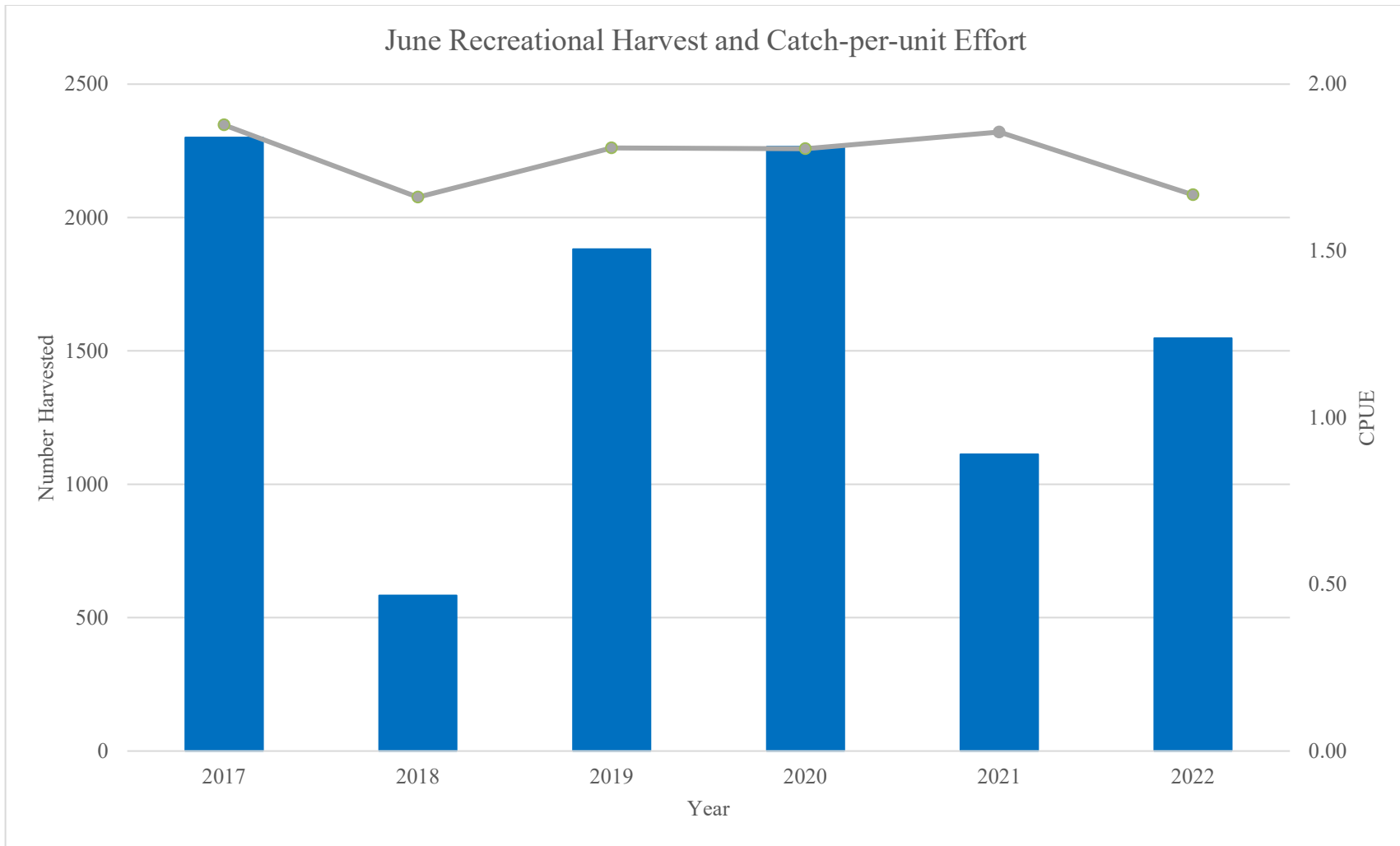


Figure 2. June total harvest (blue bars) and CPUE (gray line) of recreational anglers (private and for-hire) from 2017 – 2022 creel data.

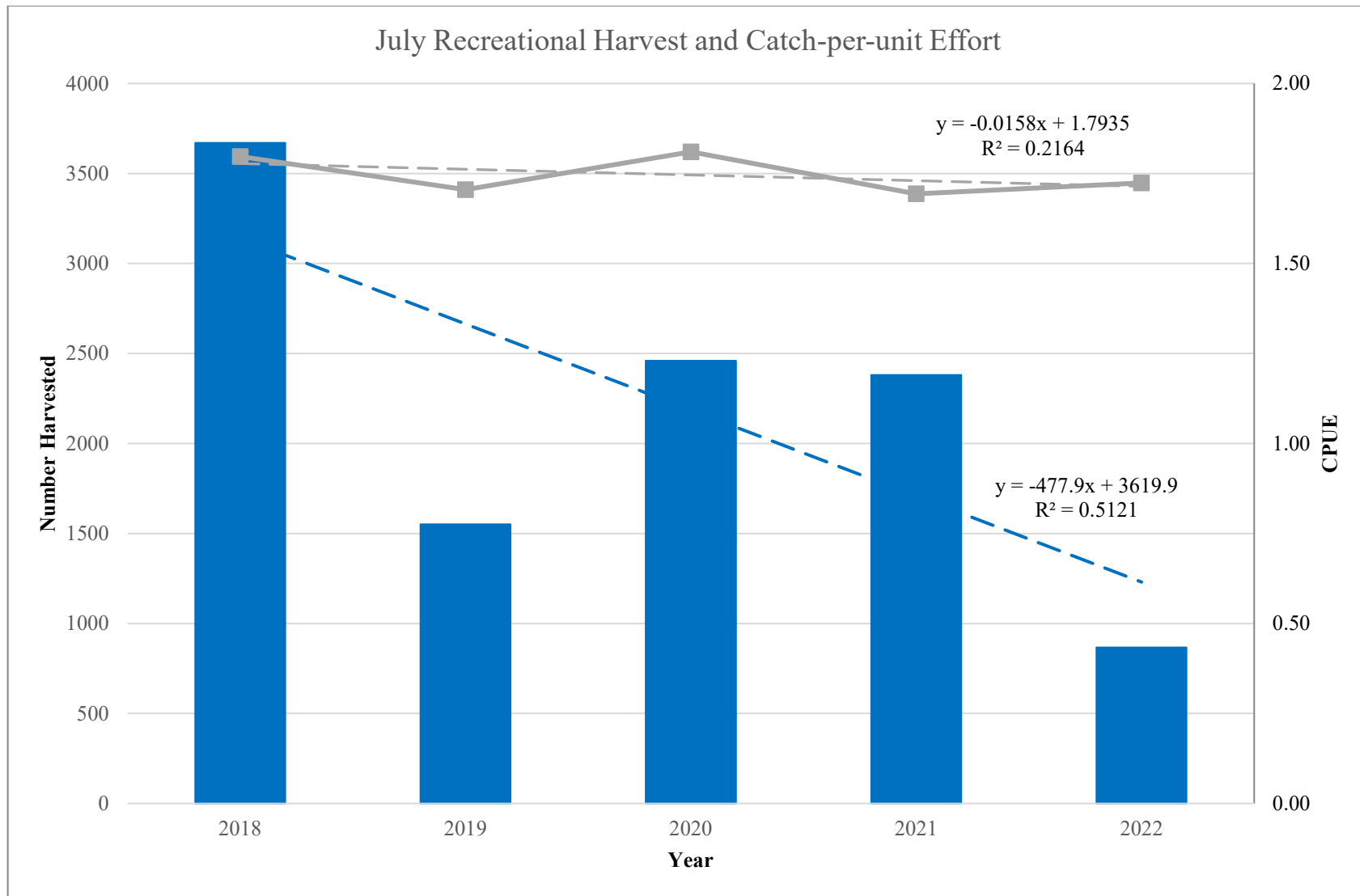


Figure 3. July total harvest (blue bars) and CPUE (gray line) of recreational anglers (private and for-hire) from 2018 – 2022 creel data. Trendlines for total harvest (dashed blue line) and CPUE (dashed gray line) along with the respective correlations are also included on the figure.



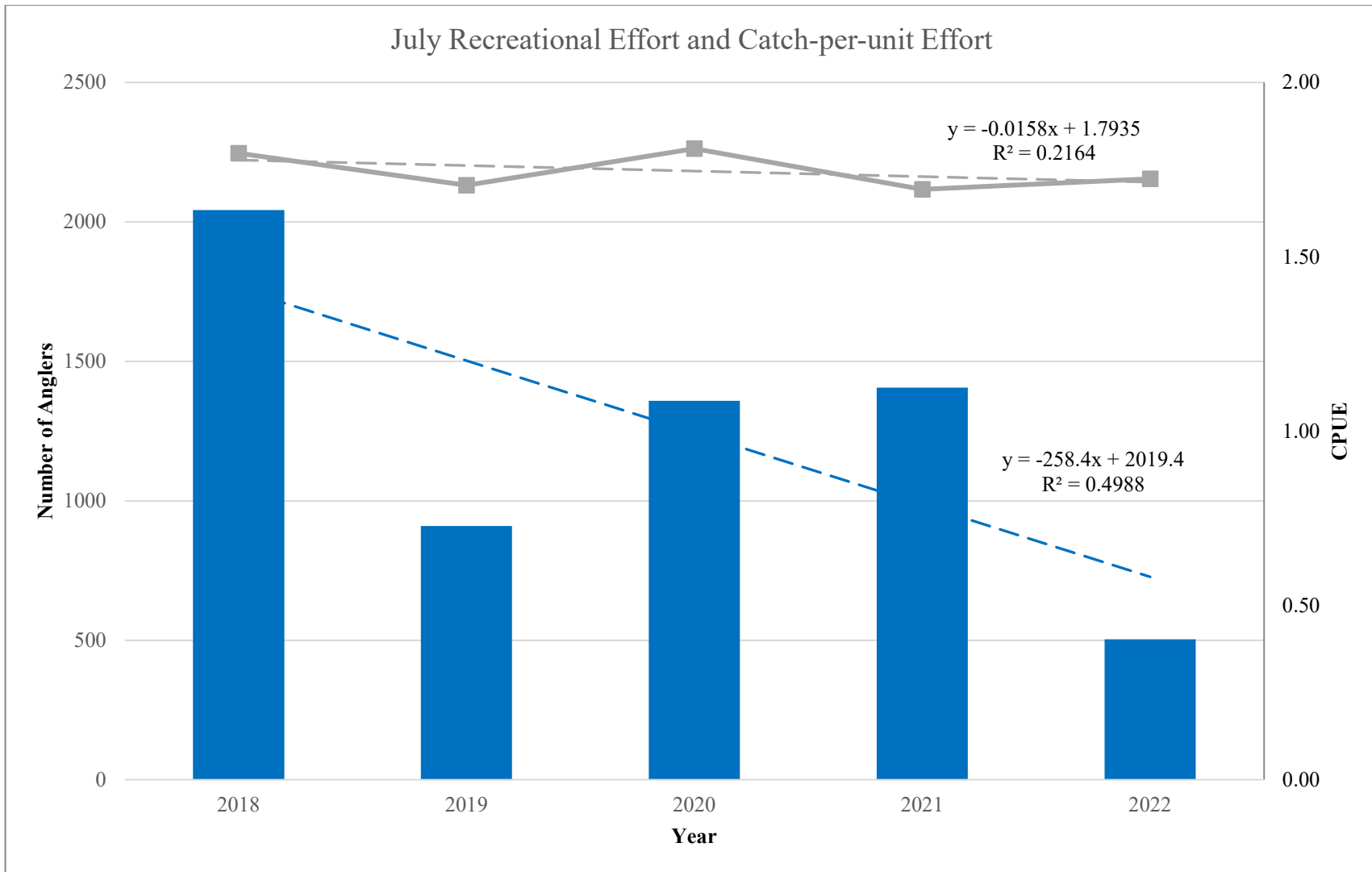
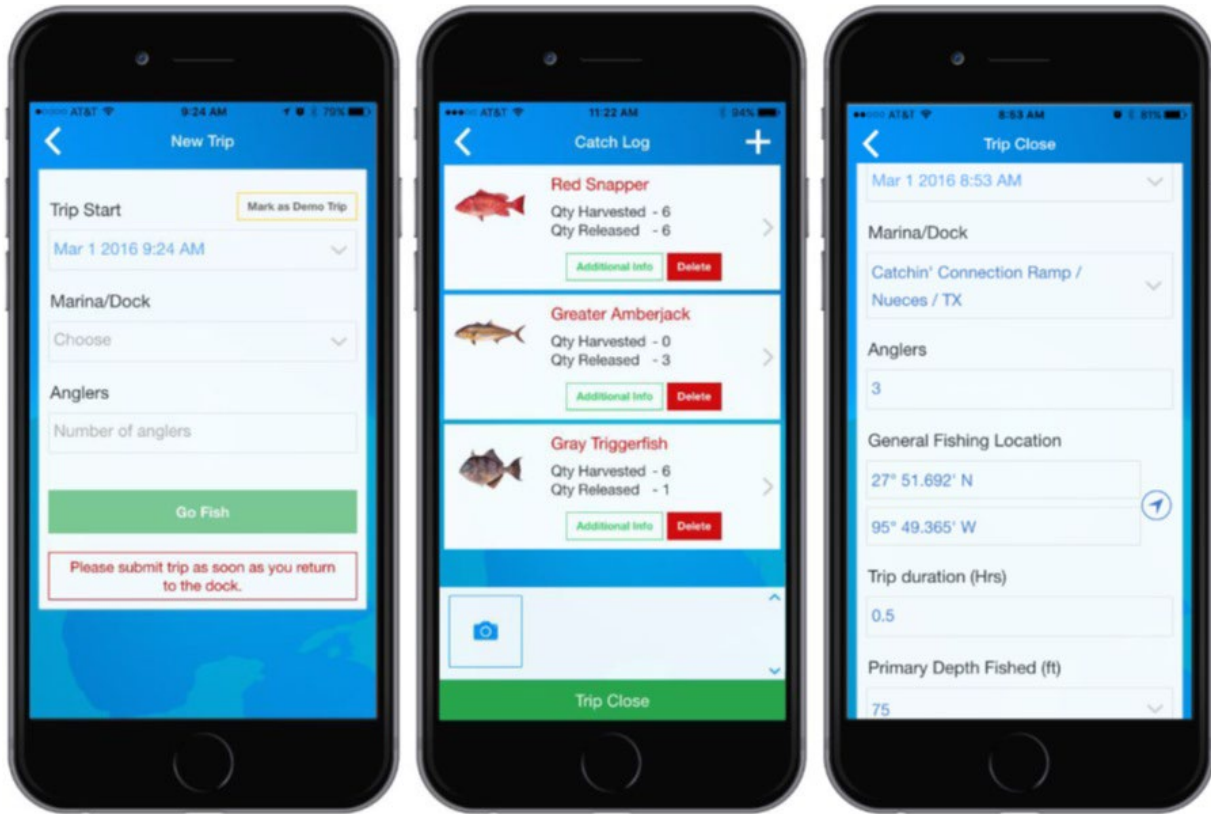


Figure 4. Total number of recreational angler-trips in July from 2018- 2022 (blue bars) and CPUE (gray line). Trendlines for angler-trips (dashed blue line) and CPUE (dashed gray line) are included, as well as the correlational coefficient for effort over time.

## VII. Images of the app and web portal



- Admin
- Users
- Fish Identification
- Trips
  - New Trip
  - Trip Stats
- Total Catch
- Largest Catch
- Trophies
- Economic Survey
- Record Inactivity
- View Report
- Add Report
- Favorites
  - Trips
  - Species

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### Trip Stats

Home

Active Trips
  Closed Trips
 -- Select State --
 -- Select County --
 -- Select Marina --

Active Trips

Active Trips Stats						
User	Vessel #	Vessel Name	Marina	Start Date	Options	
admin	N/A		Adolph Tomae County Park Ramp	12/08/2014 04:40 PM	⬆️ ⬇️ ⬅️ 🗑️	
admin	N/A		8-Mile Road Bat Camp Ramp	12/08/2014 09:42 AM	⬆️ ⬇️ ⬅️ 🗑️	