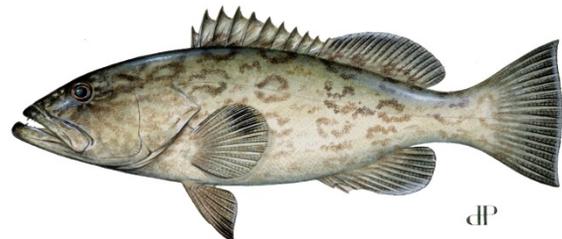
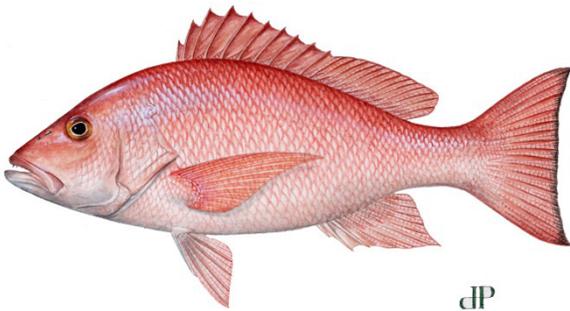


# Headboat Collaborative Pilot Program Final Report



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## List of Abbreviations

<b>Abbreviation</b>	<b>Description</b>
CS	Catch Share
Council	Gulf of Mexico Fishery Management Council
Gulf	Gulf of Mexico
EFP	Exempted Fishing Permit
e-Log	Southeast Headboat Survey's electronic logbook system
HBC	Headboat Collaborative
IBQ	Individual Bluefin Tuna Bycatch Quota
IFQ	Individual Fishing Quota
FMP	Fishery Management Plan
MRIP	Marine Recreational Information Program
OLE	Office of Law Enforcement
RA	Regional Administrator
RS	Red snapper
SERO	Southeast Regional Office
SRHS	Southeast Region Headboat Survey
VMS	Vessel Monitoring System

## EXECUTIVE SUMMARY

This Headboat Collaborative (HBC) pilot program final report provides an overview of data and information collected during the two-year program. The HBC program evaluated the viability of an allocation-based management program for Gulf of Mexico red snapper and gag. The program was in place for two years (2014-2015) and included 19 vessels in total. Vessels participating in the program were from four different regions: Florida west coast, Florida panhandle, Alabama, and Texas. The HBC program tested recording allocation and landings by number of fish instead of pounds. All transactions were recorded in near real-time in Southeast Region's online Catch Share system.

The HBC pilot program was implemented under an Exempted Fishing Permit, and allowed for the harvest of gag and red snapper outside of the designated recreational fishing season through using quota allocation. The quota allocated to the program was determined by calculating the percentage of 2011 HBC vessels' aggregated recreational landings from all 2011 recreational landings for each species. Vessel allocations were determined by the HBC members. Quota pounds were then converted to fish number to be distributed to the vessel accounts by the HBC manager. A variety of monitoring requirements were put in place to validate landings and effort. Requirements included vessel monitoring systems, trip declarations, trip notifications, daily landings reports, and restricted landing locations. Additional measures from the HBC members included a fish tag for each fish harvested under the program.

The HBC program's vessels completed over 6,600 trips during the two years. Of those trips, between 51% (2015) to 60% (2014) of the trips landed at least one HBC species. The number of HBC vessel trips peaked in summer months (June, July, and August), and were lower in winter months (November, December, January, and February). The HBC landed the majority of the red snapper allocation in both years (96% in 2014; 90% in 2015), but landed a smaller percentage of the gag allocation (51% in 2014; 38% in 2015). To determine the effectiveness of using fish numbers instead of pounds, biological sampling provided in-season weights for comparison to pre-season weights utilized to convert quota pounds to fish numbers. During the program, species average weights varied by month and region; red snapper average weights were 4-6 lb whole weight, while gag average weights were 7-16 lb gutted weight. A comparison of in-season to pre-season weights revealed differences for gag between 1.1% (2014) to 23.2% (2015) and red snapper -3.3% (2014) to 5.5% (2015). Differences varied by month and region, but the larger discrepancies were influenced by sample size and location. For both species, the HBC program participants remained under their allotted quota in pounds.

HBC participants actively transferred allocation between vessels throughout each year. Allocation transfers allow the movement of allocation to vessels according to the needs of the participants. Reasons for allocation transfers were barter, sale, or gift, although the majority of transfers did not record a reason for transfer. In general, the number of vessels, total transfers, and pounds transferred were greater for red snapper allocation than gag allocation.

An important aspect to this program was catch validation. Port agents validated 23% (2014) to 26% (2015) of all HBC trips each year. More catch validation errors (hail-in counts differed from landing counts) occurred in the first year of the program (n = 22 trips) than the second year (n = 8 trips). Catch errors included both over-counts (more reported than on-board) and under-counts (less reported than on-board). Validated trips with errors were typically off count by only 1 or 2 fish, and all errors were solely with red snapper. Only a small percentage of trips had reporting validation errors (e.g., missing hail-outs, hail-ins, or e-Logs). Many of the reporting validation errors were due to technical glitches in hardware/software that were outside the participants control. All e-Log errors were resolved and corrected as soon as identified. Port agents felt that the hail-out and hail-in requirements of the pilot

program had improved sampling efficiency, reporting accuracy, as well as interactions and cooperation of vessel captains. E-mail notifications of hail-outs and hail-ins allowed port agents to better prioritize their sampling scheme.

A socio-economic study indicated that the extension of the fishing season through this program resulted in one third of HBC trips occurring prior to the typical season and a greater number of full day trips. As a result, more customers retained HBC species and there was a reduction in discards. Revenue also increased for participants by 6-7% compared to 2013.

Suggested improvements for a full-scale project include a more centralized data collection, additional outreach to overcome technological issues, and increased biological sampling over time and space. The program showed how an allocation-based program in the for-hire industry can be successfully implemented, allowing for trip flexibility, near real-time reporting of catch, and monitoring catch in fish numbers instead of pounds.

## BACKGROUND AND INTRODUCTION

The purpose of the Headboat Collaborative (HBC) pilot program was to evaluate the viability of an allocation-based management strategy for improving the conservation of marine resources and economic stability and performance of the headboat sector. Headboats participating in the pilot program were authorized to harvest red snapper and gag using quota allocation outside the designated recreational fishing seasons (e.g., red snapper begins June 1 and gag begins July 1). The HBC submitted an application for an exempted fishing permit (EFP) to NOAA Fisheries. The application proposed evaluating the efficacy of an allocation-based management system using a limited number of headboats in a 2-year pilot study. The Gulf of Mexico Fishery Management Council (Council) reviewed the Headboat Collaborative's application at its April 2012 meeting, and recommended that NOAA Fisheries approve the application. On April 2, 2013, NOAA Fisheries published a notice of receipt of the EFP application in the *Federal Register* and requested public comments. On August 26, 2013, NOAA Fisheries announced approval and issuance of the EFP. Since the EFP was neither a fishery management plan (FMP), nor a plan amendment, and was based on legal authority independent from the FMP, NOAA Fisheries determined that it was not subject to referendum requirements.

### Exempted Fishing Permit

An EFP<sup>1</sup> is an authorization by NOAA Fisheries for the target or incidental harvest of species managed under a FMP or fishing regulations that would otherwise be prohibited. EFPs may be authorized for limited testing, public display, data collection, exploratory, health and safety, environmental cleanup, and/or hazard removal purposes. EFP applicants must submit a completed application package to the Regional Administrator (RA) at least 60 days before the desired effective date of the EFP. An applicant for an EFP need not be the owner or operator of the vessel(s) for which the EFP is requested. The application package must include, but is not limited to, the following information:

- Application date.
- Applicant's name, mailing address, and telephone number.
- A statement of the purposes and goals of the exempted fishery for which an EFP is needed, including justification for issuance of the EFP.

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<sup>1</sup> EFP regulations: 50 C.F.R. § 600.745

- For each vessel to be covered by the EFP, as soon as the information is available and before operations begin under the EFP:
  - A copy of the United States Coast Guard documentation, state license, or registration of each vessel, or the information contained on the appropriate document.
  - The current name, address, and telephone number of the owner and master, if not included on the document provided for the vessel.
- The species (target and incidental) expected to be harvested under the EFP, the amount(s) of such harvest necessary to conduct the exempted fishing, the arrangements for disposition of all regulated species harvested under the EFP, and any anticipated impacts on the environment, including impacts on fisheries, marine mammals, threatened or endangered species, and Essential Fish Habitat.
- For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used.
- The signature of the applicant.

The RA may request additional information necessary to make a determination. The RA reviews each application and makes a preliminary determination whether the application contains all of the required information and constitutes an activity appropriate for further consideration. If the RA determines that any application warrants further consideration, notification of receipt of the application is published in the *Federal Register* with a brief description of the proposal. Interested persons are given 15 to 45 days to comment on the notice of receipt of the EFP application. In addition, comments may be requested during public testimony at a Council meeting. If the Council intends to take comments on an EFP application at a Council meeting, it must include a statement to this effect in the Council meeting notice and agenda. Upon receipt of an EFP, the permit holder must date and sign the permit, and retain the permit on-board the vessel(s). The permit is not valid until signed by the permit holder. In signing the permit, the permit holder: (1) agrees to abide by all terms and conditions set forth in the permit, and all restrictions and relevant regulations and (2) acknowledges that the authority to conduct certain activities specified in the permit is conditional and subject to authorization and revocation by the RA. Unless otherwise specified in the EFP or a superseding notice or regulation, an EFP is valid for no longer than 1 year. EFPs may be renewed following the application procedures in this section.

The HBC EFP established a specific allocation of red snapper and gag, as calculated and described below under quota distribution, to be harvested during the fishing year by HBC vessels. All harvest of red snapper and gag counted against the harvest authorized by the EFP. The HBC EFP exempted the HBC's listed vessels from recreational season closures for red snapper and gag (regulations at 50 CFR § 622.34(b) and (e)). The exemption did not apply to the February-March shallow-water grouper closure offshore of 20 fathoms in the Gulf of Mexico (Gulf) [50 CFR §622.34(d)]. For gag, HBC vessels were exempted from the closure of the recreational sector when the gag catch target was reached (50 CFR § 622.8(b)). However, the EFP did not exempt the HBC participating vessels from Section 407(d) (16 U.S.C. 1883) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Section 407(d) requires that, if NOAA Fisheries determined the Gulf red snapper recreational quota had been met, harvest must be prohibited for the remainder of the fishing year, even if the HBC had allocation remaining. The HBC EFP was valid for two years, from January 1, 2014, through December 31, 2015. No recreational fishing by HBC vessels was allowed for red snapper or gag outside the EFP.

## Eligibility and Participating Vessels

To be eligible for consideration in the HBC pilot program, headboat owners/captains needed to have a valid federal Gulf charter/headboat reef fish permit and be a participant in the Southeast Region Headboat Survey (SRHS) for at least three years. Interested headboat owner/captains submitted an application (Appendix 1) for membership to the HBC. The HBC's board members selected vessels from the applicants to participate in the program. All vessels and vessel owners underwent a review by NOAA's Office of Law Enforcement (OLE) for prior civil or criminal actions. A total of 19 vessels were included over the two-year pilot program, with nine from Florida, five from Alabama, and five from Texas (Table 1). Two additional vessels participated in 2015, while the remaining 17 vessels participated in both years of the pilot program.

**Table 1: Vessels participating in the HBC pilot program**

<b>Vessel name</b>	<b>Homeport</b>	<b>Years Participating</b>
Captain John	Galveston, TX	2014-2015
New Buccaneer	Galveston, TX	2015
La Pesca	Port Aransas, TX	2014-2015
New Kingfisher	Port Aransas, TX	2014-2015
Scat Cat	Port Aransas, TX	2014-2015
Escape	Dauphin Island, AL	2014-2015
America II	Orange Beach, AL	2015
Gulf Winds II	Orange Beach, AL	2014-2015
Reel Surprise	Orange Beach, AL	2014-2015
Zeke's Lady	Orange Beach, AL	2014-2015
Destin Princess	Destin, FL	2014-2015
Destiny	Destin, FL	2014-2015
Sweet Jody	Destin, FL	2014-2015
Double Eagle II	Clearwater, FL	2014-2015
Double Eagle III	Clearwater, FL	2014-2015
Fish N Xpress	Port St. Jo, FL	2014-2015
Gulf Queen	Clearwater, FL	2014-2015
Super Queen	Clearwater, FL	2014-2015
Gulf Star	Tarpon Springs, FL	2014-2015

## PROGRAM DESIGN

### Online System

The HBC pilot program took advantage of the existing Catch Shares System (CS) infrastructure created by the Southeast Regional Office (SERO), which also hosts the Gulf Individual Fishing Quota (IFQ) commercial red snapper and grouper-tilefish programs and Bluefin tuna Individual Bycatch (IBQ) program. The CS System is an online system (<https://portal.southeast.fisheries.noaa.gov/cs>) managed by the SERO that has the ability to track all transactions (e.g., landings, allocation transfers) in real-time. The administrative functions associated with the HBC pilot program, (e.g., registration, account access, allocation transfers) were designed to be accomplished online; therefore, a participant needed access to a computer and the Internet. A new program, with customized account roles, actions, and views, was

created for the HBC pilot program. The CS system was also integrated with the NOAA Fisheries vessel monitoring system (VMS) system and the SHRS logbook system to obtain trip declarations (hail-outs) and electronic logbook information. Each participant had an online account for viewing hail-outs, hail-ins, allocation, and landings. The CS system also allowed HBC participants to transfer allocation to the HBC manager or other HBC vessels.

The HBC pilot program had two account roles: Headboat manager (HBC manager) and Headboat vessel (HBC vessel). The HBC manager account had the ability to manage and transfer allocation to any HBC vessel account, view all HBC hail-outs, hail-ins, allocation transfers, and landings. The HBC manager account received the initial allocation at the start of the fishing year and was responsible for distributing allocation to each HBC vessel account as agreed upon by the HBC members. Each vessel approved to operate under the HBC pilot program had a HBC vessel account. Through the HBC vessel account, vessel owners/captains had the ability to transfer allocation and view their hail-outs, hail-ins, and landing transactions.

## **Program Conditions and Requirements**

To ensure 100% catch accountability and to enable a transparent monitoring system, HBC vessels adhered to strict protocols to track each fish caught and landed during a trip. Each vessel had an operational VMS that allowed NOAA Fisheries to track the vessel while at sea. Vessel owners were responsible for purchasing VMS units (\$1,799 per unit), coordinating installation with the vendor, and paying for monthly service costs (~\$60 per month). All vessels used the CLS America VMS unit with the Thorium tablet. CLS America built customized software forms so that HBC participants could have a simple and efficient way to enter trip information. HBC participants submitted a VMS declaration (hail-out) through the VMS unit prior to departing on every trip, regardless of whether or not red snapper or gag was the intended target species. The hail-out contained information that informed enforcement that a vessel was participating on a for-hire trip versus a trip that was out of the fishery. Participants submitted a landing notification (hail-in) through the VMS unit at least one hour prior to returning to port regardless of whether or not red snapper or gag were landed. Hail-ins contained the vessel name, landing location, time of landing, and the number of red snapper and gag landed. The hail-out and hail-in requirements were intended to provide law enforcement agents/officers and port agents the opportunity to be present at the point of landing so they can monitor and enforce the HBC EFP requirements dockside.

Landing conditions required that HBC vessels only land at approved landing locations. Approved landing locations ensured sites actually existed and law enforcement officers and port agents could access these sites. Landing locations had to be publicly accessible by land and water.

All landings of red snapper and gag from HBC participants were attributed to quota set aside for this pilot program. HBC vessels were required to abide by a 2-fish per person per species (red snapper and gag) bag limit consistent with current recreational fishing regulations. In addition, all HBC vessels were expected to retain all legal-sized red snapper (16-inch total length) and gag (22-inch total length) that appeared to be mortally injured, as long as the bag limit or vessel allocation had not been exceeded. If a vessel's harvest exceeded the allocation available in that vessel's account, the vessel owner/captain was required to acquire sufficient allocation through an allocation transfer to cover the overage. After a vessel account's allocation was exhausted, that vessel owner/captain needed to cease any directed fishing for red snapper or gag. Each HBC vessel owner/captain needed to account for all red snapper and gag caught aboard that vessel. On the day fishing occurred, each vessel needed to submit landing reports through the SRHS electronic reporting system (Appendix 2). Landing reports contained the vessel name, number of anglers, trip location, depth fished, number of fish caught and released by species, and other biological

and socio-economic data required by the SRHS. In addition, all HBC vessels needed a copy of the EFP prominently displayed onboard the vessel and available for inspection upon request from a law enforcement officer.

To ensure accountability and ease enforcement of the program, the HBC members added a fish tag system as a requirement to join the program. The tag system was developed and managed by the HBC managers; NOAA Fisheries was not involved with any elements of the tag system. The HBC manager ordered Seton Tyvek® tags equal to the number of fish allocated to the HBC program. The Tyvek® tags were chosen because they were weatherproof, tear proof, and durable. The cost of the tags (~\$0.25/tag) was paid for by the HBC members. The tags were sequentially numbered and color-coded by species: yellow for gag and red for red snapper (Figure 1). For each fish caught, the crew was responsible for writing the vessel name, customer name, and date on the tag. Each tag came with a pre-punched hole and a wire tag. Some crews attached the tag receipt directly to the fish, some to the stringer with the fish, and others placed it inside a ziplock bag with the fish fillet. When allocation was transferred, the Tyvek® tags were also transferred, so that every fish caught by the program was associated with a tag. HBC members said that although some of the participants did not feel the tags were necessary, others found them extremely helpful when dealing with law enforcement. When law enforcement encountered customers with tagged red snapper during the closed season, they were able to confirm that the red snapper were legally caught through the HBC program and a phone call to the vessel for confirmation.

**Figure 1: HBC Tyvek® tags**



## Quota Distribution

The initial amount of quota distributed to the HBC pilot program was determined by taking aggregate 2011 HBC vessel landings (as reported to the SRHS) relative to all recreational landings reported in 2011 for each species (Formula 1). NOAA Fisheries used the 2011 landings as these were the most recent landings data at the time of the EFP application. The resulting percentage was multiplied against the red snapper quota and gag annual catch target for each year to determine the HBC’s quotas in pounds (Formula 2). Quotas in pounds were converted to quotas in numbers of fish using 2011 average regional and species-specific average weights from the SRHS program.

Formula 1. 2011 HBC Proportion

$$\frac{HBC\ Vessel\ Landings_{Species,2011}}{Recreational\ Landings_{Species,2011}} = HBC\%_{Species}$$

Formula 2. HBC Quota

$$HBC\%_{Species} \times Recreational\ Quota/ACT_{Species, Year} = HBC\ quota_{Species, Year}$$

The proportion of quota allocated to the HBC program differed each year due to the vessels participating (17 vessels in 2014 versus 19 vessels in 2015) and incorporation of changes in the Marine Resource Information Program (MRIP) sampling protocols. In March of 2013, MRIP changed the sampling protocols to include dockside interviews of private anglers in the late afternoon and evening, a time frame not extensively captured during previous mail surveys. Landings data under this new method were greater than comparable landings in earlier years. In the summer of 2014, an MRIP calibration workshop developed methods to rescale the MRIP estimates from 2004-2012 to account for possible under-sampling outside of these “peak” hours. The revised recreational landings estimates were generally 10% to 20% greater than those used previously. Accordingly, SERO used the recalibrated MRIP 2011 landings to apportion quota to the HBC program (Table 2). This resulted in the HBC receiving a smaller proportion of the recreational quota in 2015 despite an increase in the number of vessels participating (Table 3). In 2015, the red snapper total allowable catch was increased from 11 million pounds (mp) whole weight (ww) to 14.3 mp ww, which resulted in an increase effective on June 1, 2015. Accordingly, the HBC program received their proportional increase on the effective date.

**Table 2: 2011 recreational landings pre- and post-MRIP recalibration**

	Red Snapper		Gag	
	Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration
MRIP landings	3,480,305 lb ww	5,908,426 lb ww	725,896 lb gw	854,105 lb gw
Recreational landings	4,305,989 lb ww	6,734,110 lb ww	776,668 lb gw	904,877 lb gw

**Table 3: HBC final quota distribution**

	2014		2015	
	Red snapper	Gag	Red snapper	Gag
Recreational quota /target catch level	5.39 mp ww	1.51 mp gw	7.007 mp ww	1.708 mp gw
HBC percentage	5.3146%	2.8343%	4.0031 %	2.4431 %
HBC allocation in pounds	286,457 lb ww	43,053 lb gw	280,497 lb ww	41,728 lb gw
Average fish weight	5.16 lb ww	7.16 lb gw	5.05 lb ww	7.04 lb gw
HBC allocation in fish	55,527 fish	6,017 fish	55,497 fish	5,925 fish

Initial allocation was distributed to the HBC Manager account on January 1 of each year. The HBC Manager then distributed allocation to each vessel. The EFP allowed HBC participants to decide how to distribute the allocation amongst the participating vessels and allowed trading within the HBC. The HBC participants decided to base proportionally distribute vessel allocation based on each vessel’s 2011 landings history. On June 1, 2015, the HBC proportion of the red snapper quota increase was distributed to the HBC manager, who then distributed it to participants.

## Data validation and monitoring

SERO Catch Share staff audited hail-outs, hail-ins, and landing transactions. Auditing of the data occurred every 1 to 3 days, each week, with daily audits during the peak red snapper season. During auditing, catch share support staff ensured that for each trip the vessel made (as validated by VMS), there was a hail-out, hail-in, and e-Log, and that the fish declared on the hail-in matched the number of fish on the e-Log. If discrepancies were found, the staff contacted the HBC owner/captain and/or local port agent and worked to resolve the issue. The auditing process involved staff monitoring the VMS system to identify when a vessel had left port and if they declared a HBC trip. Missing hail-outs were due to (1) user error - captain did not submit a hail-out, (2) VMS unit error - information entered into the unit, but it was not received or (3) VMS server error - information sent to the server, but an error occurred between the unit's server and VMS databases. Submitted hail-ins for each HBC trip were identified and linked with a hail-out. Similar to hail-outs, missing hail-ins occurred for the reasons listed above. Landing transactions were monitored to ensure that the number of red snapper and gag reported match the hail-in. Missing landing transactions were due to (1) user error - captain did not submit an e-Log, submitted incorrect information (e.g., entered number under the wrong species), or did not correctly submit the e-Log, or (2) there was a delay or malfunction in transmitting the data from the SRHS data system to the CS system. Most landing transaction errors were due to user input, particularly failure to properly submit the e-Log (e.g., Captain thought the e-Log was sent) or failure to submit an e-Log.

To aid law enforcement, e-mails were sent to state and federal law enforcement officers, as well as state and federal port agents, each time a vessel made a hail-out or a hail-in. Law enforcement officers and port agents used the e-mails to prioritize their sampling and coordination with other law enforcement agents or port agents.

NOAA Fisheries used existing dockside and at-sea sampling methodologies by federal and state port agents, with a priority on red snapper and gag catches, to validate HBC vessel catches. Port agents validated the fish on-board the vessel with the number reported in the hail-in. Port agents also collected biological information on a sub-sample of the catch, which provided NOAA Fisheries with in-season weights by region and month. Fish (in numbers) were converted to pounds using two methods: pre-season and in-season average weights. Pre-season average weights were calculated prior to the start of the program across all months by region. In-season average weights were calculated by using the current year's HBC vessel dockside sampling per month by region. If sample sizes were low (< x fish), when possible, data were used from the entire SRHS program, combined with similar regions, and/or combined from adjacent months in the same region to calculate an in-season weight. Despite these measures, there were some areas where a low sample size could not be overcome through these methods and therefore, the actual sample size was used. In-season average weights were updated every 15-30 days as the information became available and landing estimates in both numbers and pounds were posted to the SERO Catch Share Web site.

## PROGRAM REVIEW AND PERFORMANCE

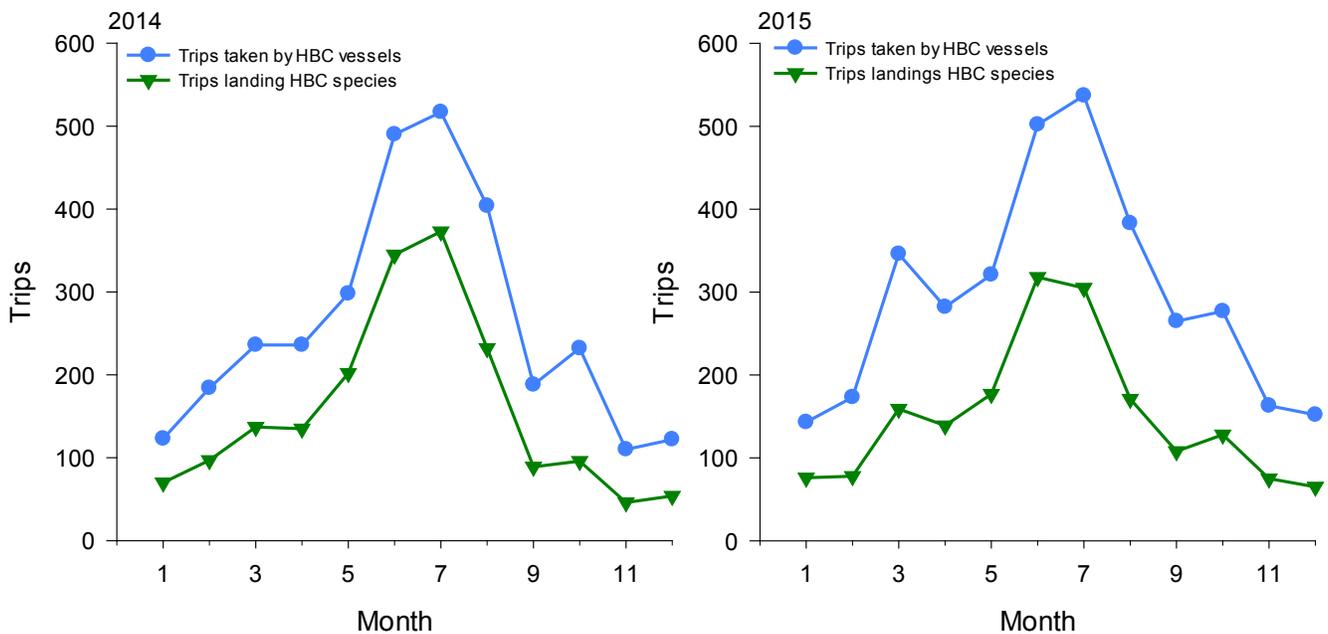
### Trip level Information

The vessels participating in the program took more than 3,000 trips each year, with between 50-60% of those trips landings either red snapper or gag (Table 4, Figure 2). More HBC trips landed red snapper (~1,300 trips/year) than gag (~560-700 trips/year) in both years. Per month, there were between 100-500 trips taken, with an individual vessel having an average of 17/trips per month, with a minimum of 1 trip/month and maximum of 58 trips/month. Average trips that landed HBC species differed slightly

between years with 12 trips/month in 2014 and 10 trips/month in 2015. In general, there were more HBC trips taken and more trips landing HBC species in the summer months (June, July, and August) (Table 4) than other times of the year.

**Table 4: Trips taken by HBC vessels.**

Month	Total HBC trips		Trips landing HBC species		Trips landing red snapper		Trips landing gag	
	2014	2015	2014	2015	2014	2015	2014	2015
January	123	143	70	76	39	40	39	43
February	184	173	97	78	68	42	43	47
March	236	346	137	159	89	122	51	52
April	236	282	135	139	88	104	61	56
May	298	321	202	177	146	143	79	53
June	490	502	345	318	287	294	77	38
July	517	537	373	305	312	280	80	37
August	404	383	232	171	185	129	54	48
September	188	265	89	108	39	77	51	32
October	232	277	96	128	38	83	64	62
November	110	163	46	75	3	29	44	48
December	122	152	54	65	1	15	54	50
<b>Total</b>	<b>3,140</b>	<b>3,544</b>	<b>1,876</b>	<b>1,799</b>	<b>1,295</b>	<b>1,358</b>	<b>697</b>	<b>566</b>



**Figure 2: Total trips and trips with HBC species landed by month.**

Most, but not all, of the vessels landed both red snapper and gag within each year. On average, there were 8/trips per month that landed red snapper, with the greatest number of red snapper trips/month occurring in the summer season in both years. During those months, the number of red snapper trips/month increased to values between 14-24 trips/month. Vessels landed an average of 38 red snapper/trip, with as low as one red snapper/trip and as great as 200 red snapper/trip. Similarly, there was an average of 8/trips

per month that landed gag, with the greatest number of trips landing gag occurring in December. Gag landings in 2015 were more evenly distributed than in 2014. In 2014, there were slightly more trips/month in March and June than other months (excluding December). During December, the number of gag trips/month for a vessel was as great as 29 trips/month. Vessels landed an average of 4 gag/trip, with as low as one gag/trip and as great as 50 gag/trip.

HBC vessels took trips of differing lengths. Trips lengths were divided into 4 categories: half-day trips (< 6 hours), three-quarters day trips (6 to 8 hours), full-day trips (8 to 14 hours), and multi-day trips (two or more days). In both years, the majority of trips were full day trips, followed by half-day trips (Table 5). Nearly all vessels had back-to-back half-day trips, where two trips were made within the same day, at some point within the year. Some vessels completed back-to-back trips more frequently, and these trips accounted for 30% to 90% of their trips. In contrast, approximately only half of the vessels in the program took at least one multi-day trip. Only one vessel had multi-day trips as the highest proportion of trip taken.

**Table 5: Percentage of trips taken by trips length**

<b>Trip Length</b>	<b>2014</b>	<b>2015</b>
Half day (< 6 hours)	35%	36%
Three-quarters day (6 – 8 hours)	19%	18%
Full day (8 – 14 hours)	42%	42%
Multi-day (two or more days)	4%	4%

## Quota Usage and Tracking

### Fish to Weight Conversion Analysis

NOAA Fisheries tracked HBC quota in numbers of fish rather than pounds of fish landed. NOAA Fisheries calculated the number of fish distributed to the program using pre-season weights and converted landings to numbers of fish using in-season weights. Landings in pounds were compared using both the pre-season and in-season weight conversions (Figure 3). Differences between weight conversions varied monthly, and were influenced by sampling size and location. Monthly differences between pre-season and in-season weights ranged between -21.8% and 57.5% (Tables 6 and 7). The extreme differences occurred more frequently in gag weight comparisons, and these were limited by the sample sizes of gag across time and space. Sampling areas to calculate in-season weights utilized the areas defined by the SRHS, as area fished was a required field in the e-Log reports (Figure 4). Samples collecting red snapper biological data were greater in the Florida panhandle (area 23), Alabama (area 29), and southern Texas (area 26), then the other areas. Samples collecting gag biological data were greater in the Florida peninsula (area 21) then the remaining areas. Pre-season and in-season weights were more similar in 2014 than 2015 for both species. Annual red snapper difference went from -3.3% (in-season weights less than pre-season weights) in 2014 to 5.5% in 2015 (Table 6). Annual gag weights differed by only 1.1% in 2014, but increased to 23.2% in 2015 (Table 7). Based on numbers of fish and quota pounds, the HBC program landed a higher percentage of their quota in 2014 than 2015. Quota in pounds revealed a slightly higher percentage of the quota landed than in fish numbers in each year for both red snapper (2014: 98.9% in fish vs 99.1% in pounds; 2015: 84.5% in fish vs 90% in pounds) and gag (2014: 50.3% in fish vs 50.7% in pounds; 2015: 29.8% in fish versus 37.5% in pounds).

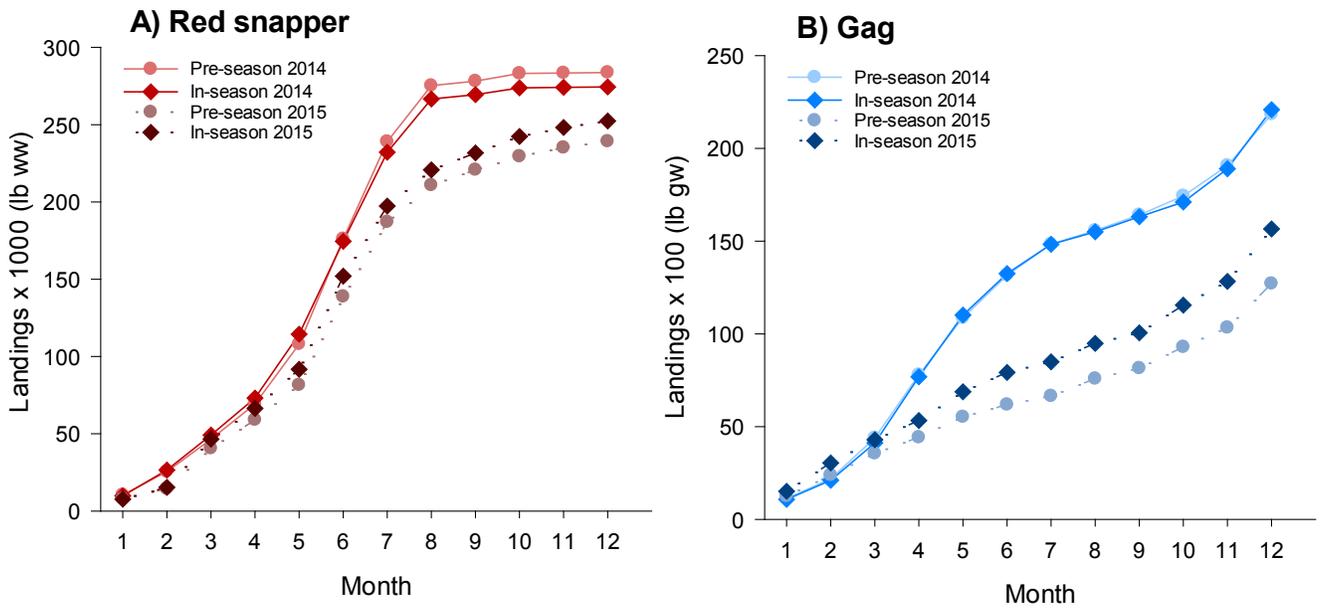


Figure 3: Cumulative monthly pre-season and in-season weights for red snapper (A) and gag (B).

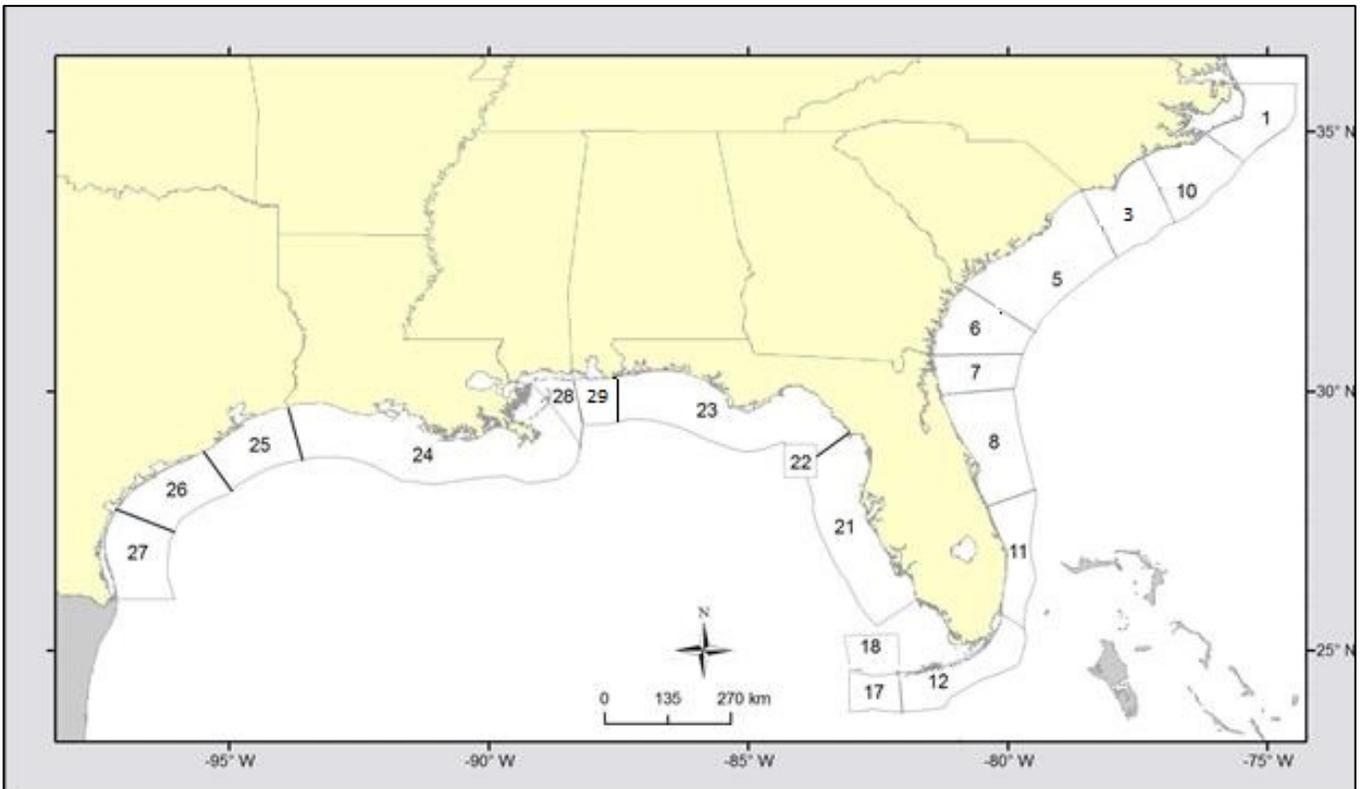


Figure 4: SRHS area fished map.

**Table 6: Pre-season and in-season red snapper pounds landed**

Mon.	2014					2015				
	Fish sampled	Pre-season lb	In-season lb	In – Pre (lb)	% Diff.	Fish sampled	Pre-season lb	In-season lb	In – Pre (lb)	% Diff.
Jan	499	10,435	9,839	-596	-5.7%	344	7,840	7,641	-199	-2.5%
Feb	782	15,032	16,718	1,686	11.2%	408	6,602	7,642	1,041	15.8%
Mar	1,036	20,993	22,589	1,596	7.6%	760	26,081	31,210	5,129	19.7%
Apr	762	22,774	23,914	1,140	5.0%	477	18,438	19,876	1,438	7.8%
May	1,136	38,682	41,323	2,642	6.8%	630	22,536	25,285	2,749	12.2%
Jun	1,383	68,156	60,184	-7,972	-11.7%	460	57,280	60,375	3,094	5.4%
Jul	810	62,929	57,565	-5,364	-8.5%	596	48,270	45,341	-2,929	-6.1%
Aug	548	36,292	34,476	-1,816	-5.0%	368	23,783	23,396	-387	-1.6%
Sep	78	2,876	2,878	1	0.0%	252	9,931	10,994	1,063	10.7%
Oct	56	4,946	4,357	-589	-11.9%	181	8,737	10,570	1,833	21.0%
Nov	-	341	336	-4	-1.3%	145	5,653	5,827	174	3.1%
Dec	-	305	265	-40	-13.0%	100	4,015	4,251	236	5.9%
<b>Year</b>	<b>7,090</b>	<b>283,759</b>	<b>274,443</b>	<b>-9,316</b>	<b>-3.3%</b>	<b>4,721</b>	<b>239,165</b>	<b>252,407</b>	<b>13,241</b>	<b>5.5%</b>

**Table 7: Pre-season and in-season gag pounds landed**

Mon.	2014					2015				
	Fish sampled	Pre-season lb	In-season lb	In – Pre (lb)	% Diff.	Fish sampled	Pre-season lb	In-season lb	In – Pre (lb)	% Diff.
Jan	63	1,123	1,076	-47	-4.2%	81	1,250	1,512	262	21.0%
Feb	63	1,067	1,027	-40	-3.7%	49	1,135	1,527	392	34.5%
Mar	105	2,202	2,013	-189	-8.6%	62	1,171	1,248	77	6.6%
Apr	124	3,398	3,566	168	5.0%	37	864	1,037	173	20.1%
May	147	3,082	3,340	258	8.4%	65	1,096	1,547	451	41.2%
Jun	148	2,288	2,234	-53	-2.3%	21	664	1,045	381	57.5%
Jul	60	1,683	1,576	-107	-6.4%	25	470	570	100	21.3%
Aug	55	734	671	-63	-8.6%	59	929	992	63	6.8%
Sep	69	844	816	-28	-3.3%	41	569	571	1	0.3%
Oct	42	1,017	795	-221	-21.8%	70	1,138	1,503	364	32.0%
Nov	118	1,639	1,790	151	9.2%	75	1,042	1,278	236	22.6%
Dec	136	2,763	3,184	421	15.3%	112	2,381	2,828	447	18.8%
<b>Year</b>	<b>1,130</b>	<b>21,838</b>	<b>22,087</b>	<b>249</b>	<b>1.1%</b>	<b>697</b>	<b>12,709</b>	<b>15,659</b>	<b>2,950</b>	<b>23.2%</b>

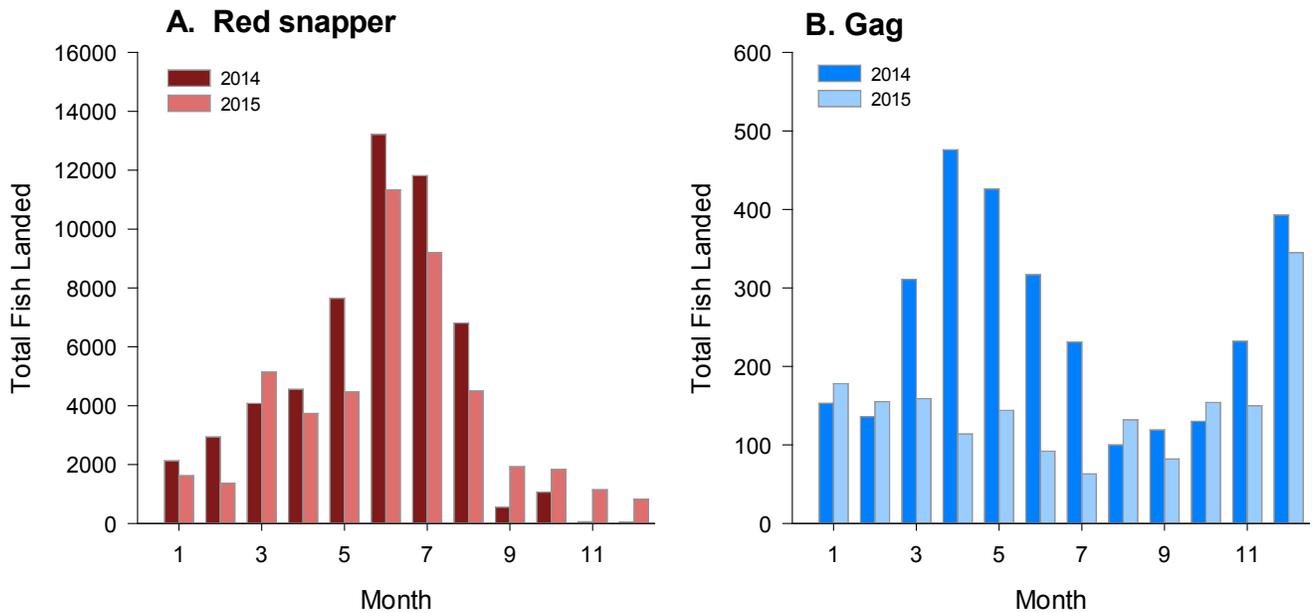
### Red snapper landings

Red snapper landings and average weights varied by year, month, and region. In 2014, the areas with greater landings (in fish or pounds) were the Florida panhandle and Texas regions, while in 2015, Texas landings were considerably greater than the other regions (Table 8). Landings were greater in the summer months for both years (Figure 5). Landings in the months at the end of the year in 2015 were slightly greater than 2014, but this may be attributed to the in-season quota increase in 2015. In 2014, HBC fishermen had landed over 90% of the quota (in pounds) by August, while in 2015 this was achieved in December (Figure 3). Landings at the end of the year were also influenced by concerns about the closure of the red snapper season due to section 407(d) of the Magnuson-Stevens Act that prohibit any additional landings in the year if NOAA Fisheries determined the Gulf red snapper recreational quota had been met.

Average monthly red snapper weights across regions were between 2 lb ww to 10 lb ww (Table 9). Gulf-wide the average weight varied by 1-2 lb ww monthly, with averages as low as 4 lb ww and as great as 6 lb ww. Average red snapper weights were greatest in the Florida peninsula (2014 = 6.15 lb ww, 2015 = 6.86 lb ww) and smallest in the Florida panhandle (2014 = 4.40 lb ww, 2015 = 4.75 lb ww). While the Florida peninsula had the greatest average weight, by month this region also had the lowest weight (Oct 2014 = 2.16 lb ww) and the greatest weight (Feb 2014 = 9.91 lb ww), indicating that weights in this region may be highly variable. The greater weights typically were from area 22, a deep-water area off Florida, while the lowest weights corresponded with the Florida peninsula and low sample sizes.

**Table 8: Landings by region and species**

Region	Red snapper				Gag			
	Number of Fish		Pounds of Fish (ww)		Number of Fish		Pounds of Fish (gw)	
	2014	2015	2014	2015	2014	2015	2014	2015
Florida peninsula	1,179	783	7,252	5,369	2877	1,637	20,533	13,696
Florida panhandle	20,479	12,669	90,083	60,199	137	113	1,431	1,704
Alabama	12,833	11,080	66,409	64,388	8	13	95	125
Texas	20,416	22,579	110,699	122,450	2	5	29	85



**Figure 5: Monthly number of fish landed for (A) red snapper and (B) gag**

**Table 9: Red snapper average weights**

Month	Florida peninsula		Florida panhandle		Alabama		Texas		Gulf-wide	
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Jan		4.85	4.45	4.49	5.90	4.83	4.86	5.00	4.63	4.71
Feb	9.91	7.04	5.10	5.17	5.90	6.10	6.08	6.14	5.70	5.59
Mar		6.06	4.77	5.04	4.62	5.22	6.41	7.15	5.54	6.07
Apr	9.55	7.83	4.59	4.15	5.74	5.12	6.05	6.60	5.25	5.32
May	7.93	7.50	4.99	4.97	6.29	6.15	5.70	5.82	5.40	5.66
Jun	5.99	8.20	3.88	4.87	4.67	6.53	5.15	5.10	4.55	5.33
Jul	5.24	5.60	4.04	3.66	4.97	4.54	5.14	5.26	4.87	4.93
Aug	4.07	5.69	4.09	4.96	5.43	6.92	5.16	4.87	5.07	5.20
Sep	4.22	4.07	4.15	4.43	6.40	7.28	5.04	4.76	5.20	5.70
Oct	2.16	4.07	4.04	5.98	6.40	5.35		6.58	4.10	5.76
Nov	3.73			3.91	6.40	5.35		5.77	5.70	5.10
Dec	5.30			4.12		5.35		6.14	5.30	5.15
Average	6.15	6.86	4.40	4.75	5.17	5.81	5.42	5.42	5.00	5.36

**Gag landings**

Gag landings and average weights also varied by year, month, and region. In both years, the greatest landings (in fish or pounds) occurred in the Florida peninsula region, while Texas had the least landings (Table 8). In 2014, gag landings peaked in April, May, June, and December, but in 2015 landings were greatest in December and consistent across all other months (Figure 5). Average gag weights across regions were between 6 lb gw and 24 lb gw (Table 10). Gulf-wide average weights varied by 1-6 lb gw monthly, with averages as low as 6 lb gw and as great as 11 lb gw (Table 10). Average weights in the Florida peninsula were more similar across months and lower than other regions (2014 = 7.14 lb gw; 2015 = 8.37 lb gw). Many of the larger average gag weights in the other regions, particularly in Alabama (2014 = 11.82 lb gw, 2015 = 9.59 lb gw) and Texas (2014 = 14.51 lb gw, 2015 = 16.95 lb gw), were the result of low sample sizes and not a preponderance of large gag landed.

**Table 10: Gag average weights**

Month	FL peninsula		FL panhandle		Alabama		Texas		Gulf-wide	
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015
Jan	6.62	8.8	11.89	12.88					7.03	8.50
Feb	6.72	10.72	10.20	12.88				16.95	7.55	9.85
Mar	6.28	7.16	14.57	11.94		10.14		16.95	6.47	7.85
Apr	7.58	8.27	14.57	11.94	14.57	10.14			7.49	9.10
May	8.21	12.87	11.42	13.46	11.42	10.14		16.95	7.84	10.74
Jun	7.69	11.38	11.42	14.70	11.42				7.05	11.36
Jul	7.39	9.77	11.42	14.70	11.42	9.25			6.82	9.05
Aug	7.31	8.99	11.42	14.70	11.42	10.14	14.51		6.71	7.52
Sep	7.36	6.71	6.04	14.70			14.51		6.86	6.96
Oct	6.14	7.21	6.04	23.69					6.12	9.76
Nov	7.72	8.43	6.04	23.69					7.72	8.52
Dec	8.17	8.10							8.10	8.05
Average	7.14	8.37	10.44	15.08	11.82	9.59	14.51	16.95	7.30	8.83

## Allocation Transfers

Each year, the HBC managers decided to establish quota reserves of 5% each of the aggregate red snapper and gag allocations to ensure the HBC remained in compliance with its catch limits. The reserve amounts were deducted from aggregate allocations prior to individual distributions by the HBC manager. In coordination with NOAA Fisheries, the HBC Manager monitored each HBC vessel’s landings in numbers and pounds of fish throughout the fishing years. If the estimated average fish weight of red snapper or gag landed by a vessel was less than or equal to the average pre-season weight used by NOAA Fisheries for determining aggregate allocations, then the reserve amount was released to that vessel. If estimated average fish weights landed by a vessel exceeded average pre-season weights, then the Manager either adjusted initial distributions as necessary to ensure the maintenance of the reserve amount was sufficient to avoid an overage or released a portion of the reserve amount to that member if the release would not result in an overage. Accordingly, the HBC remained below its catch limits (as expressed both in numbers and pounds of fish) for red snapper and gag in both years. Allocation transfers between the HBC manager and the vessels are not counted in the allocation transfer analysis.

Allocation was transferred among vessel accounts each year. For each transfer, the transferee would select a reason for the transfer. The transferee could select one of four reasons: No comment, Bartered trade, Sale to another vessel, or Gift. In both years, the reason most selected was No comment (Table 11). Transfers typically occurred between vessels within the same area (68-70% of all transactions). The number of red snapper allocation transactions and the total red snapper transferred were greater in 2014 than 2015, although these difference do not appear to be substantial (Table 12). In comparison, more gag were transferred in 2015 than 2014, although the number of transactions were similar to 2014 (Table 12).

**Table 11: Allocation transfers reasons**

<b>Reason</b>	<b>2014</b>	<b>2015</b>
No comment	13	12
Bartered trade	6	2
Sale to another vessel	5	6
Gift	7	3

**Table 12: Allocation transfers**

	<b>Transactions</b>	<b>2014</b>		<b>2015</b>		
		<b>Fish</b>	<b>Vessels</b>	<b>Transactions</b>	<b>Fish</b>	<b>Vessels</b>
Red snapper	28	3,288	11	19	3,008	10
Gag	3	49	2	4	106	3

## Reporting Compliance

Each year a portion of the HBC trips were sampled by port agents. For these validation trips, port agents counted the number of fish on-board, compared those to the hail-in notification, and took biological samples (e.g., fish weight, fish length, otolith removal). Each year, port agents sampled 23% (2014) to 26% (2015) of the HBC trips for catch validation. Monthly, port agents validated catch of 35 to 109 trips, resulting in 10% to 47% of monthly trips samples (Table 8). Differences in sampling across months were

due to the volume of trips taken each month and availability of sampling agents. The summer months had an increase in trips taken, which resulted in a lower percentage of trips sampled, despite the large number of trips sampled.

**Table 13: Number of validated HBC trips.**

Month	2014			2015		
	Total Trips	Trips Validated	% Validated	Total Trips	Trips Validated	% Validated
January	123	58	47%	143	54	38%
February	184	65	35%	173	53	31%
March	236	62	26%	346	109	32%
April	236	44	19%	282	82	29%
May	298	74	25%	321	77	24%
June	490	63	13%	502	68	14%
July	517	55	11%	537	98	18%
August	404	97	24%	383	84	22%
September	188	52	28%	265	86	32%
October	232	60	26%	277	80	29%
November	110	42	38%	163	69	42%
December	122	35	29%	152	44	29%
<b>Total</b>	<b>3,140</b>	<b>707</b>	<b>23%</b>	<b>3,544</b>	<b>904</b>	<b>26%</b>

In the first year, there were 22 trips where a port agent’s trip validation count differed from the submitted hail-in, with the majority of these trips occurring in the first half of the year. By the second year, there were only 8 trips where the port agent’s count differed from the hail-in count. All trips discrepancies were for counts of red snapper. Discrepancies in counts contained both over-counts (captain entered more red snapper on the hail-in than were actually present) and under-counts (captain entered less red snapper than reported on the hail-in). Counts typically differed by only 1 to 2 fish, with the largest discrepancy at 6 fish. Throughout the year, the HBC vessels reported 33 less fish than were on-board the vessel and reported 14 more fish than were on-board the vessel, for a net difference of 19 fish. These 19 red snapper compromise less than 1% of the red snapper landed by HBC vessels. All discrepancies, both under and over-counts, were corrected in allocation deductions and landings by SERO and SRHS staff.

Discrepancies happened for a variety of reasons: mate or captain unfamiliar with the protocols and/or software, misidentification or misreporting of vermilion snapper as red snapper, counts recorded as the wrong species in the e-Log submission form (e.g., red porgy instead of red snapper), transposing numbers when entering them into the system (hail-in or e-Log), and confusing trip counts when two trips were taken on the same day. Many times, the captain/owner was proactive in notifying the port agent when a typographical error was made in entering the counts into the hail-in or e-Log forms.

Each year a small percentage of the trips had a missing hail-out, hail-in, or e-Log. Over both years, 8% of the trips were missing a hail-out, although a large percentage (74%) of these were due to technical problems with the VMS system, and were outside of the participant’s control. Failure to submit a hail-out accounted for the remainder of missing hail-outs. Likewise, 7% of all the trips did not have a hail-in and again the majority (71%) was due to VMS technical issues and outside of the participant’s control. The percentage of missing hail-outs and hail-ins were considerably higher in 2015 than 2014. This was

mostly due to VMS problems that began in January and were continued through February. The VMS vendor worked closely with both SERO and VMS staff to resolve the issues.

Captains were supposed to report landings through the SRHS e-Log system on the day the trip was completed. If trips were not submitted SERO staff followed up with the captains/owners of the vessel during auditing until all e-Logs were submitted. In the first year only 62 of the trips (2%) did not submit the e-Log in a timely manner. In the second year the number of trips submitting late increased to 212 (6%). Some vessels submitted all e-Logs in a timely manner, and many of the late submissions belonged to just a few vessels. In some of these cases, the captain/owner did submit the e-Log into the system but failed to hit submit or there was a glitch in the connection between the SRHS database and the SERO database. There were some instances where the captain/owner forgot to submit the e-Log, especially when many trips were being taken or a new captain was operating the vessel that was less familiar with the reporting requirements. While all missing e-Logs were resolved within a few days after SERO staff contacted the owner, some of the landings required several phone calls or e-mails until final resolution.

## Socio-economic Impacts

HBC members worked collaboratively with Dr. Joshua Abbott at Arizona State University to conduct a socio-economic study of the effects of the HBC program. HBC members signed confidentiality waivers allowing historical and HBC vessel and trip specific landings and fishing effort data to be released for use in the socio-economic analysis. NOAA Fisheries supplied SRHS logbooks files from 2014-2015 for all vessels covered under the HBC program for which the permit was under the same ownership as during the program. NOAA Fisheries also supplied aggregated SRHS data at the scale of weeks and region for both HBC and non-HBC vessels from 2003-2015. SRHS collects trip level catch and effort data and species specific catch and discard information.

Additional surveys (in-person and mail in) were conducted for all HBC owners at the start and end of the pilot study to establish pre-HBC and within-HBC economic information. The surveys asked structured questions to solicit data on key economic variables (e.g., trip offerings, pricing, variable and fixed costs) as well as open-ended questions about business practices. These data were used in combination with the SRHS data to analyze socio-economic impacts. Abbott and Willard (2017) investigated the impacts of the pilot study on four aspects: seasonal reallocation of trips and landings (all trips and trips retaining HBC species), trip length (e.g., full day vs partial day), discards (trip level discards and discard per angler-day), and revenues (total and net; with and without premium pricing).

Abbott and Willard (2017) determined that for trips retaining the HBC species, there was an overall smoothing of trips and landings over the seasons. Not only did one-third of the trips retaining red snapper occur prior to the traditional season, but the HBC vessels were also able to fish past the season to create an August fishing season. Likewise, nearly 50% of the gag trips occurred prior to July 1. These extended fishing seasons resulted in more customers retaining HBC species in 2014 (117%) and 2015 (90%) than in 2013. While the number of trips and customers retaining HBC species increased, the landings were constrained by the quota allocated to the program. Red snapper trips increased 161% compared to 2013, but landings only increased 82% in 2014 and 31% in 2015 compared to 2013 (Abbott and Willard, 2017). For gag, trips increased in both 2014 (74%) and 2015 (39%), while gag landings increased only by 56% in 2014 and decreased by 9% in 2015 compared to 2013 (Abbott and Willard, 2017). Compared to 2013, the total retained fish per angler was either similar (2014) or increased (2015), although the number of HBC species retained per angler fell for both red snapper and gag. Abbott and Willard (2017) suggest

this was due to the substitution of non-HBC species, which ensured "...that customers went home with a full, diverse bag of fish while also providing access to red snapper and gag out of season."

Abbott and Willard (2017) compared trip lengths from 2013 with trips during the HBC pilot study and found an increase in full day trips on several HBC vessels, with rates that matched or exceed any observed since 2004. Likewise, they found an even greater increase in the trip length for trips retaining HBC species. Abbott and Willard (2017) determined that not only did some HBC vessels increase the number of full day trips, but many HBC vessels also set aside more of their HBC allocation for full day trips. Some vessels accomplished this by implementing a 1-fish bag limit on partial day trips, but a 2-fish bag limit on full day trips.

Comparisons of discards revealed that during the HBC pilot study, discards from HBC vessels decreased and were some of the lowest discard rates since 2008 (Abbott and Willard, 2017). They found discard rates were similar during the traditional season, but considerably lower during the off-season times. Therefore, the overall decrease in discards is a direct result of allowing retention of HBC species during the traditional off-season time periods. In comparison, the non-HBC fleet discards for red snapper increased in 2014 and decreased slightly in 2015, while gag discard rates were similar in 2014 and 2015 to 2013 (Abbott and Willard, 2017).

Comparisons of revenue to 2013 data revealed a 7.6% increase in 2014 and a 6.1% increase in 2015 (Abbott and Willard, 2017). These revenue comparisons did not include any mark up for trips retaining HBC species. Only a small number of vessels (2014 = 5; 2015 = 3) charged a mark-up price for trips retaining HBC species, with increased trip prices by 13% (\$5-20) on average. Those mark ups increased overall HBC revenues by an additional 1.3% (2014) and 1.1% (2015). There were differences in the sources of revenue gains in 2014 and 2015, with 2014 having two thirds of the increase arising from more passengers per trip, while in 2015 only one third was from increased passengers per trip. Abbott and Willard (2017) determined that a strong driver of the remaining increases in revenues came from the aforementioned increase in full day trips, which allowed more customers to access the HBC species during the longer fishing season. Revenue increases mainly resulted from trips retaining HBC species outside of the typical HBC species' seasons.

Abbott and Willard (2017) expected the following results to continue to occur if a full catch share program was implemented among headboat vessels:

- Increased access to anglers for catch share species across the year
- Reduced landings of catch share species per angler, albeit over a larger number of anglers, compared to landings of anglers during a derby season; Anglers will land a more diverse bag of fish as other species are substituted for the reduced catch share species
- Reduced discards due to elimination of closed seasons and the associated necessity of regulatory discards
- Increased profits due to the ability to offer customers a higher quality trip (i.e., a trip where catch share species are available year-round) at a time that best matches customers' varying demand pattern across time and area

In contrast, Abbott and Willard (2017) expect that vessels will create differentiated trip offerings and pricing to serve anglers with varying strengths of preferences for retaining catch share species. They also expect that potential modest increases in trip prices under a catch share may occur for some trips, if some customers are willing to pay more for access to certain catch share species. The transferability of the quota may also drive trip pricing if quota is scarce.

## **Enforcement and Port Agent Sampling**

As part of the review of the program, port agents and law enforcement officers/agents were asked to provide feedback about the program. Their feedback fell into three main categories: e-mail notifications of hail-outs and hail-ins, sampling efficiency, and cooperation of HBC captains.

Most agents appreciated the e-mail notifications of hail-outs and hail-ins because the notifications allowed them to prioritize sampling. The hail-ins contain the expected number of HBC species on-board, and for agents that receive the hail-in prior to traveling to the marina this allowed them to ensure they had sufficient supplies for biological sampling. Some agents felt that the one-hour notification was not sufficient advanced notice for dockside inspection/sampling, as they sometimes had to travel 1 to 4 hours to reach a sampling site. These agents that had a long distance to travel relied on the hail-outs for scheduling their sampling. Some agents went an extra step and called the business or marina to help determine when the vessel would return. All agents agreed that the expected number of fish on the hail-in allowed them to immediately identify a discrepancy between the actual count and the hail-in count, and found this feature invaluable for monitoring the program. There were times when hail-outs and/or hail-in e-mails did not arrive in the agent's e-mail in a timely manner. These were generally due to either VMS problems or glitches in the e-mail system, as described earlier.

Many of the agents felt that the hail-out/hail-in notifications had improved sampling efficiency and reporting accuracy, as the vessel captains knew that accurate reporting was required for program participation and that validation checks occurred to ensure accurate reporting. Agents suggested that two agents per vessel be assigned during the busier time frame or summer months. In summer months, the fish tend to be kept on ice and out of the sun as much as possible, which delayed counts and biological sampling. By having two agents, one could count fish while the other began the biological sampling. Multiple port agents would also be useful for boats that completed two trips a day and were generally scheduled to leave an hour after returning from the first trip. Agents also suggested requiring the vessels to keep the snapper and groupers separate (e.g., separate stringers). This would increase sampling efficiency, as agents would not have to search through all the boxes for snappers and groupers. The reduction in looking for snapper and grouper would reduce counting time, increase counting accuracy, and increase time for biological sampling. A final recommendation from the agents was that if any state or federal law enforcement agent intercepted an HBC vessel instead of a port agent that the state enforcement agent report the fish count on-board to help verify reported versus landed fish.

All agents felt that there was good cooperation with the HBC vessels and that the captains were very helpful during sampling. Agents felt that the program has created a much closer relationship with the owners, captains, office personnel, and vessel crew, with many of the agents now on a first name basis with the crews. This increased cooperation was also seen when the vessel crew encouraged the anglers on-board to have their fish biologically sampled before filleting the fish. Even when discrepancies in counts occurred, the captain and agent worked together and recounted the fish to verify the accuracy of reporting.

## **Program Administration**

The HBC pilot study included oversight and administration by NOAA Fisheries. Both direct and indirect costs were associated with the program during the first year. Indirect and direct costs included software development of the online system, personnel for customer service and auditing of notifications and landings, travel to meetings with HBC members, dockside sampling by port agents, and enforcement by NOAA and state law enforcement agents/officers. No new personnel were hired by SERO to support the

program. Partial staff time for some SERO Catch Share personnel, information technology specialists, and NOAA law enforcement agents/officers familiar with catch share programs was used to administer, develop, implement, and monitor the HBC. The Gulf States Marine Fisheries Commission also entered into contracts with independent contractors as port agents to validate catches and trip reports of HBC and non-HBC vessels. The contractors also collected biological samples and effort data from headboats which operate from Texas to Florida.

## CHALLENGES AND IMPLEMENTATION CONSIDERATIONS

While many aspects of the program worked extremely well during the pilot study, there were still areas for future improvement. One challenge that occurred was the submission of hail-outs, hail-ins, and e-Logs. As the VMS hail-out and hail-in requirements were new to the captains, there was a learning curve in the early months of the program as the captains learned how to properly send hail-outs and hail-ins. Additionally, timeliness of e-Logs continued to be an area for improvement. All e-Logs, even those trips that did not catch HBC species, were required to be submitted on the day of the trip, which was different from the SRHS weekly reporting requirements. SERO staff monitored all hail-out, hail-in, and e-Log reports, and contacted the HBC owners or captains when data were missing or late. SERO staff spent the equivalent of approximately one full-time person on the project. If a similar program was initiated Gulf-wide, additional continual outreach should be considered to aid fishermen, particularly if there are frequent changes in captains, in learning the requirements of the program. If all headboats were participating in a program, SERO would need to hire additional staff to handle the workload. Some of the cost of these staff members would be recouped through the mandated cost recovery fees required of all catch share programs.

Another challenge with this program was the reliability of the VMS system. The CLS America units use blue-tooth connectivity; in some instances, there were vessels that had problems with the blue-tooth connection. The failure of the blue-tooth connection was not always obvious, and therefore the captains believed their hail-outs/hail-ins were submitted when they were not actually submitted. Furthermore, at least once a participant who owned multiple vessels brought the wrong blue-tooth tablet out on a trip. The tablet was reporting for a vessel in port, while the VMS was registering a vessel out at sea. The vessel owners immediately realized the problem and contacted Catch Share staff to address the issue. In addition, there were problems with data connections between CLS America system, VMS, and the SERO CS system. Failures could occur between any of these connections, and identifying where a failure occurred was sometimes difficult to troubleshoot. Technical support from all (CLS America, VMS, Visma Consulting, and SERO technical support) parties was involved in identifying problems and providing solutions. Since the program has ended, the connectivity and issues between the CLS America units and the VMS system have been rectified and are no longer a concern. If this program was to be expanded to the entire Gulf headboat fleet, consideration should be placed into setting standards and consistency for each of the VMS units approved for such a program. While there are national standards, additional standards might be necessary to ensure the program is run effectively with minimal errors.

One lesson learned from this pilot program is that the data entry should be centralized with all information (e-Logs, validations, corrections) being entered through one data platform. Validation activities required careful collaboration between state agencies and NOAA Fisheries, but are essential to a smoothly working system. Some additional technical changes would be to add a trip submission date field, include a flag to indicate when a record was updated, and to assign a unique identifier to all records to help with data processing. Problems also arose with data connections between the SRHS system and the SERO database. The link between these two systems was not instantaneous. This led to SRHS staff spending

additional time confirming trip reports. The SRHS system currently has no method to flag when a record has been corrected. This led to SERO staff spending additional time tracking down data corrections and ensuring that those corrections were updated in the SERO CS system and allocation correctly assigned. If this program was to be expanded to the entire Gulf headboat fleet, data linkages should be addressed between the different systems or consolidated into one system. Headway is already being made in this area as the region moves forward with electronic reporting in the for-hire fleet. Items being addressed through this action include a central data warehouse, data correction options, instantaneous reporting to multiple systems, and avenues for port agents and law enforcement to interact with the system.

Another concern for the HBC program is the number of biological samples taken per region and month. These samples were used to estimate in-season weights. For some regions and months there were insufficient samples to estimate in-season weights. SERO staff resolved this by combining similar months, regions, or months and regions to generate in-season weights. In-season weights were important as the HBC allocation is in number of fish instead of weight. With the differences in weight by region and month, accurate weight samples help to ensure the HBC pilot program does not go over their quota in weight. If this program was to be expanded to the entire Gulf headboat fleet, NOAA Fisheries would need to assure that adequate samples for number to weight conversions are collected by region. Some additional improvements were suggested by various staff working with the program. In particular, an automatic method to link a trip from hail-out, to hail-in, to landing would be beneficial. This would reduce the amount of time staff takes in manually linking hail-outs, hail-ins, and landings and provide an efficient method to determine when a data connection failed. The automatic method would allow a view to be built so that HBC vessel owners could self-monitor their trips. Additionally, port agents recommended that hail-outs also indicate 1) whether the trip was targeting HBC species, 2) if they were fishing in federal or state waters, and 3) report expected landing date and time.

## CONCLUSIONS

This pilot study demonstrated that the allocation-based management strategy typically seen in commercial fleets can be a viable option in the for-hire fleets. The allocation-based program allowed each vessel operator the flexibility to adapt the trips offered to best suit their specific needs, including changes in trip length, timing of trips, and pricing for trips.

This pilot study had a number of successes that show the ways in which an allocation-based program could be successful in the for-hire industry. An allocation-based program, in general, allows for a longer fishing season, as participants determine when and how to use their allocation. For the HBC pilot study, this resulted in an increased number of anglers having access to red snapper and gag year round. Despite an increase in the number of anglers accessing the fishery, the discards were typically lower than a traditional management strategy. Both the increased angler access and decreased discards were due to the ability to fish and retain catch year round as well as the flexibility to obtain additional allocation from other participants. The flexibility of an allocation-based program also led to increased profits for the participants. This would be expected to be translated through to a full-scale allocation-based program, with increased profits resulting from the flexibility to offer customers quality trips (e.g., year round fishing for a species) at a time that best suited for that customer (e.g., time and area of interest to the customer).

While most allocation-based programs have allocation distributed in pounds, this program investigated the use of fish counts in place of pounds. For-hire trip landings differ from commercial in that individual customers retain their catch, typically on one line (commonly called a 'stringer'). Using fish counts

instead of weights provides a simple method to quickly account for all landings on a for-hire trip. While there was some variability in time and space between the average in-season to pre-season weights, this method was deemed an effective method for allocation-based program in the recreational for-hire fishery.

Many allocation-based program for commercial fisheries, rely on the validation between the harvester (e.g., vessel) and the dealer/processor. In a recreational for-hire fishery, this type of validation does not exist. The model used in this study was successful at validating landings for this study. A large part of this success was the use of a hail-in fish count. The count of fish in the hail-in was done prior to landing. Port agents or law enforcement officers could then use this report to validate actual fish counts on board. The final step was the submission of the electronic logbook. Most of the fish count errors were due to miscounting or typographical errors. The use of the three-step method aided in identifying and correcting records and could serve as a validation tool for a future full scale project.

In conclusion, an allocation-based program could be successfully created in the recreational for-hire industry, with sufficient validation and flexibility to satisfy captains, customers, and fishery managers. As with any allocation-based program, the design should reflect the specific needs, goals, and objectives of the program.

## LITERATURE CITED

Abbott, Joshua K and Daniel Willard. 2017. Rights-based management for recreational for-hire fisheries: Evidence from a policy trial. Fisheries Research: 196, 106-116.

## APPENDICES

### Appendix 1. Headboat Collaborative Application Questions

1. Name, Vessel Name, Permit #
2. Homeport
3. Size of Vessel (length and number of passengers)
4. Average fishing trip duration
5. Approximately how many days do you fish during each year on average?
6. Do you typically land more red snapper or gag? What are your other primary target species?
7. Have you ever received a Notice of Violation and Assessment or Notice of Permit Sanction from NMFS?
8. Have you reviewed the terms of the EFP issued by NMFS for this pilot program?
9. Why do you want to participate in this pilot program?
10. Is there any other information you wish to provide to assist the Collaborative in reviewing your application?

## Appendix 2. SRHS e-Log forms

Southeast Region Headboat Survey
(kenneth.brennan@noaa.gov) My Account Sign out

Dashboard

**Trip Report**

New Trip Report

Past Trip Reports

**Inactivity Report**

Inactivity Reports

**Manage**

Manage Captains

Species Favorites

**Admin Panel**

Manage Areas

Manage Species

Manage Vessels

Manage Users

Export Data

**Maps**

Area Maps

**Videos**

Getting Started

### Create a New Trip Report

**Trip Details:**

Trip Report #: **215**

Depart Date/Time: 12/15/2014 00:00    Return Date/Time: 12/15/2014 00:00

Vessel: Testing Vessel    Captain: -- Select --

**Passenger Info:**

# of Anglers (customers that fished): 0    # of Paying Passengers (anglers + non anglers): 0    # of Crew (excluding captain): 0

**Fuel:** Fuel used (gallons): 0    Price per Gallon (estimate): 0

**Depths Fished (ft.):** Minimum: 0    Maximum: 0    Primary: -- Select --

**Location:**

Lat/Long Degrees: -- Select --

Latitude Minutes: -- Select --    Longitude Minutes: -- Select --

**SAVE TRIP REPORT INFORMATION**

### Catch Information

Show Species Grid  
 Show All Species  
 Order Species By Most Reported

Species: -- Select --    Number Kept: 0    Number Released: 0

**SAVE CATCH INFORMATION**

	Species Name	Number Kept	Number Released	
Edit	ALMACO JACK	5	0	Delete
Edit	BANDED RUDDERFISH	7	0	Delete
Edit	ATLANTIC SHARPNOSE SHARK	0	14	Delete
Edit	BLACK SEABASS	25	300	Delete
Edit	GAG	2	1	Delete
Edit	LITTLE TUNNY	2	0	Delete
Edit	RED PORGY	11	38	Delete
Edit	RED SNAPPER	0	21	Delete
Edit	REMORA	0	3	Delete
Edit	SPOTTAIL PINFISH	45	0	Delete
Edit	GRAY TRIGGERFISH	77	0	Delete
Edit	VERMILION SNAPPER	132	48	Delete

### Appendix 3. Instructions for CLS American VMS forms

#### Trip Declaration (hail-out)

VMS declarations are made prior to departing for a trip, regardless of whether or not you plan to harvest red snapper or gag. Declarations are made through the CLS America VMS tablet. To declare a trip, you will need to select the Forms option on the main screen. Then select the SE Declaration (Figure A2.1), followed by SE Declaration – Headboat Collaborative Version (Figure A2.2). Then select the “Gulf of Mexico” for the Activity Code, “No” for the power down exemption, “No” for the research trip exemption, “Reef Fish” for the target species, and “Headboat Collaborative EFP” for the type of fishing. Click the submit button to submit the declaration.

Figure A2.1

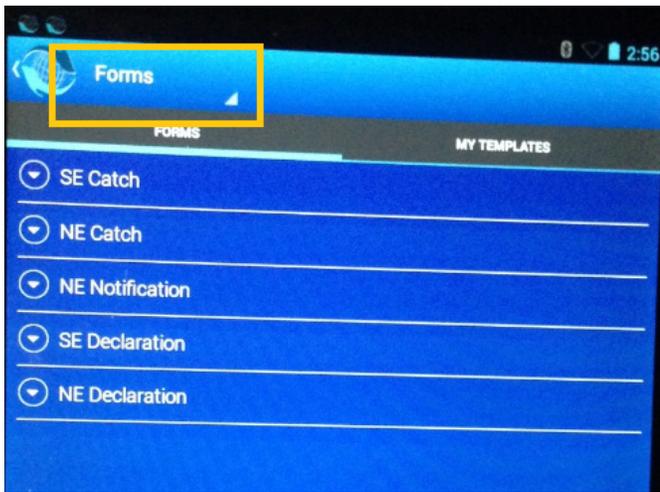
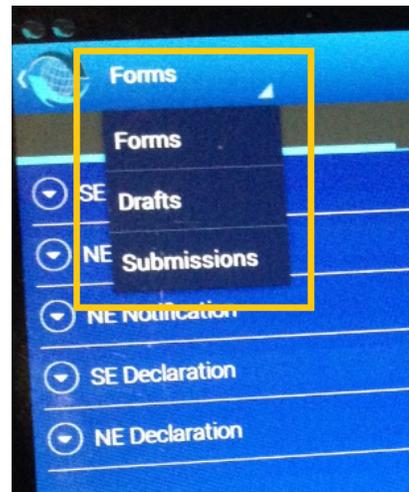


Figure A2.2



## Appendix 4. Number of fish sampled from HBC vessel by region

Note: Regions correspond to Figure 5, a map of the defined area

Red Snapper 2014								Red Snapper2015						
Mon.	21	22	23	25	26	29	Total	21	22	23	25	26	29	Total
Jan	0	0	297	64	138	0	499	0	0	230	71	0	43	344
Feb	0	15	203	52	279	233	782	0	14	191	0	102	101	408
Mar	0	0	331	29	539	137	1036	2	14	168	10	268	298	760
Apr	0	4	248	55	308	147	762	19	0	233	0	100	125	477
May	57	21	365	51	356	286	1136	32	19	101	0	323	155	630
Jun	46	33	157	38	753	359	1386	28	19	117	17	175	104	460
Jul	0	72	131	71	210	326	810	16	87	138	22	185	148	596
Aug	7	0	130	0	56	355	548	19	8	41	10	208	82	368
Sep	0	14	40	0	0	24	78	1	0	78	5	87	81	252
Oct	1	0	55	0	0	0	56	4	0	75	0	40	62	181
Nov	0	0	0	0	0	0	0	0	0	82	0	63	0	145
Dec	0	0	0	0	0	0	0	0	0	36	64	0	0	100

Gag 2014								Gag 2015						
Mon.	21	22	23	25	26	29	Total	21	22	23	25	26	29	Total
Jan	56	0	7	0	0	0	63	66	15	0	0	0	0	81
Feb	42	16	4	0	1	0	63	33	5	8	0	3	0	49
Mar	94	11	0	0	0	0	105	32	26	3	0	0	1	62
Apr	107	16	1	0	0	0	124	30	6	1	0	0	0	37
May	143	0	4	0	0	0	147	56	6	3	0	0	0	65
Jun	148	0	0	0	0	0	148	14	6	1	0	0	0	21
Jul	50	10	0	0	0	0	60	13	9	0	0	0	3	25
Aug	51	4	0	0	0	0	55	59	0	0	0	0	0	59
Sep	59	10	0	0	0	0	69	37	3	0	0	0	1	41
Oct	40	0	2	0	0	0	42	53	14	3	0	0	0	70
Nov	109	9	0	0	0	0	118	48	27	0	0	0	0	75
Dec	115	21	0	0	0	0	136	64	78	0	0	0	0	112

\*Note that this table does not include sample sizes from SRHS vessels that were not in the HBC program, but may have been used to calculate an in-season weight.

## Appendix 5. Screenshot of the Catch Share Website

### Headboat Vessel Homepage

The screenshot shows the NOAA Fisheries SERO Catch Shares Program Headboat Collaborative System - Headboat Vessel Home page. The page includes a navigation menu with links for Home, Allocation, Hail Out, Landing Locations, Landings, Notifications, Messages, My Account, and Log Out. The header displays the NOAA logo and the text "NOAA FISHERIES | SERO Catch Shares Program". The main content area features an "Important Messages" section with a message about the current version of the system (4.2.0.4) and an "Allocation Summary for 2014 in numbers of fish" table. The table has five columns: Share Category, Allocation Transfers In, Allocation Transfers Out, Landings, and Current Allocation. The data shows zero values for all categories. At the bottom, there is a customer support contact number (866-425-7627) and email (NMFS.SER.CatchShare@noaa.gov), along with a warning about browser refresh and back buttons.

NOAA Home | Weather | Oceans | Fisheries | Charting | Satellites | Climate | Research | Coasts | Careers | Privacy

NOAA FISHERIES | SERO Catch Shares Program

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

OPERATIONAL v4.2.0.4

Home Allocation Hail Out Landing Locations Landings Notifications Messages My Account Log Out

Today is Wednesday, December 3, 2014 Welcome

### Headboat Collaborative System - Headboat Vessel Home

#### Important Messages

ALL New!!! As of 12/2/2014, the current version of the Catch Shares Online System is 4.2.0.4. If you do not have this version, please close your web browser and reopen the application.

#### Allocation Summary for 2014 in numbers of fish

Share Category	Allocation Transfers In	Allocation Transfers Out	Landings	Current Allocation
HBC GAG	0	0	0	0
HBC RED SNAPPER	0	0	0	0

Customer Support Toll-Free 866-425-7627  
Customer Support Email NMFS.SER.CatchShare@noaa.gov

Additional Information

WARNING: Using the browser's refresh or back button will log you out of the application. All unsaved transactions will be lost.

This is the first screen Headboat Vessels will see after logging on to the HBC system.

#### Features:

1. The menu bar allows you to access other pages which you can use to view and transfer allocation, review your hail-outs, review landing locations, review landings, review hail-ins, view messages, and update your account.
2. The top portion of the screen will list all important messages that relate to the HBC program.
3. The lower table will summarize your HBC annual allocation by share category. The table will also include allocation transferred into and out of your account during the year, total annual landings, and current allocation remaining to be used.

## View Allocation

**View Allocation**

**1**

**Shareholder Allocation**

Share Category	Quantity	Units
HGG		NUMBERS
HRS		NUMBERS

**2**

**Vessel Allocation**

Vessel Account	Vessel Name	Vessel Number	Share Category	Quantity	Units
GLFQ4621	GULF QUEEN	611950	HGG		NUMBERS
GSTR2539	GULF STAR	1039798	HGG		NUMBERS
GWND8439	GULF WINDS II	904227	HGG		NUMBERS
REEL7251	REEL SURPRISE	904088	HGG		NUMBERS
CPJN8641	CAPT JOHN	1152450	HGG		NUMBERS
DBLE2542	DOUBLE EAGLE II	522907	HGG		NUMBERS
DBLE3683	DOUBLE EAGLE III	622650	HGG		NUMBERS
SPRQ9065	SUPER QUEEN	541178	HGG		NUMBERS

[Print PDF](#)

On the menu bar select **Allocation** then select **View Allocation**.

### Features:

1. The table on the left summarizes the annual allocation (in numbers of fish) held by your account. This table will include only allocation that has not been landed during the year or that has not been transferred to a Headboat Vessel account.
2. The table on the right summarizes allocation (in numbers of fish) on all Headboat Vessel accounts. Allocation may be transferred to your Headboat Vessel account from the Headboat Manager account or from other Headboat Vessel accounts. The allocation in your Headboat Vessel account must be sufficient to cover the amount being landed on a trip.

## View Vessel Allocation

NOAA Home | Weather | Oceans | Fisheries | Charting | Satellites | Climate | Research | Coasts | Careers | Privacy

**NOAA FISHERIES** | SERO Catch Shares Program  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

OPERATIONAL v4.2.0.4

Home Allocation Hail Out Landing Locations Landings Notifications Messages My Account Log Out

### View Vessel Allocation

Vessel	Share Category	Numbers
DPRN7145	HGG	
DPRN7145	HRS	

**Transferred In**

Date	From UserID	From Name	Share Category	Numbers	Conf. Number

**Transferred Out**

Date	To UserID	To Name	Share Category	Numbers	Conf. Number

On the menu bar select **Allocation**, then select **View Vessel Allocation**

1. The top table provides a summary of the allocation currently in your Headboat Vessel account.
2. The next table shows each allocation transfer INTO your Headboat Vessel account. This can be sorted by date, transferee, share category, or number of fish.
3. The last table shows each allocation transfer OUT of your Headboat Vessel account. This can be sorted by date, transferee, share category, or number of fish.

## View Landing Notifications (Hail-ins)

NOAA Home | Weather | Oceans | Fisheries | Charting | Satellites | Climate | Research | Coasts | Careers | Privacy

**NOAA FISHERIES** | SERO Catch Shares Program  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

OPERATIONAL v4.2.0.4

Home Allocation Hail Out Landing Locations Landings **Notifications** Messages My Account Log Out

1 View Notifications

Search:  2014

Date	Vessel Account	Vessel	Dealer	Dealer	Landing Conf.	Notification Conf

**Detail of Selected Landing**

Landing Date: Dealer: Vessel:  
 Conf. Number: DBA: Shareholder:  
 Trip Ticket: Facility:  
 Total Price: Address:  
 Total CRF: City, State:

Species	Share Category	Quantity	Units	Type	Price/Unit	Total Price	CRF

On the menu bar select **Notifications** then select **View Notifications**

Every landing notification that you have made will be displayed on the **View Notifications** page. You can use this page to match up your landings transaction history (previous page) with your landing notifications.

1. You can search your notifications by vessel, confirmation number, date, or landing location.
2. Select a landing notification from the table by clicking it to highlight the row in blue. Details from the landing transaction that you select will be displayed in the space below.

You can also view your landings from previous years by selecting the year filter at the top.





## GLOSSARY

**HBC Shares** – The HBC program receives a **percentage of the recreational quota**. This percentage was based on HBC vessels' 2011 landings relative to the entire 2011 recreational landings.

**Share Category** – HBC share categories are established for two species: Gag (*Mycteroperca microlepis*) and Red Snapper (*Lutjanus campechanus*)

**Allocation** – For the HBC program, allocation refers to number of fish per share category you are ensured the opportunity to possess, land, or sell in a calendar year. Any unused red snapper allocation expires when it is determined that the quota was met. Any unused gag allocation expires on December 31 of each year. Allocation is calculated by multiplying the HBC shares by the entire recreational quota, resulting in pounds of allocation. Allocation pounds are then converted to fish by applying an average weight by region and species. The HBC manager receives all of the allocation at the start of each year and distributes allocation to the HBC vessels. Allocation may change from year to year if the total recreational quota changes or average weights by region and species change.

**HBC Manager** – The HBC manager is an individual responsible for managing and transferring initial allocation to all HBC vessels. The HBC manager receives initial allocation at the start of the fishing year and may view all vessels' landings and allocation transfers.

**HBC Vessel** – These are vessels approved to operate under the HBC pilot program. Each vessel has an account in the HBC online system where they can transfer allocation and view their landings. A maximum of 20 vessels are authorized to participate in the HBC each year.

**Landing Notification (Hail-in)** - You must make a landing notification at least one hour in advance of landing. When providing a landing notification, you will be asked to provide your vessel identification number, landing location, date and time of landing, and estimated landings in numbers per share category. Landing notifications can be submitted using your vessel's VMS unit.

**Landing-** Landing means to arrive at a dock, berth, beach, seawall, or ramp.

**Landing Transaction** – Landing transactions are processed through the SRHS electronic-logbook (e-Log) program. Landings must be entered by the end of each day a trip is taken. Landing reports are transferred to the HBC Online system, where they are debited from a HBC vessel's allocation.

**VMS Declaration (Hail-out)** - You must make a trip declaration prior to leaving the dock. VMS declarations can only be made through your VMS unit.