

**Judging Size Limits on Blue Marlin in the Gulf Coast Triple
Crown**

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Executive Summary:

The Gulf Coast Triple Crown is a series of five Blue Marlin tournaments that take place during the summer in four different gulf coast states: Louisiana, Mississippi, Alabama, and Florida. Each state hosts one tournament, and Alabama hosts two. In these tournaments, the main goal is to catch and weigh the biggest Atlantic Blue Marlin. Being caught and weighed means the fish is killed. In order to be killed, a Blue Marlin must meet a size limit. The size limits in the Gulf Coast Triple Crown are determined by length, meaning a Blue Marlin has to reach a certain minimum length in order to be killed. Currently, most Blue Marlin that place 1st, 2nd, and 3rd (and win money) in these tournaments generally weigh over 500 pounds. However, the current size length limits in the Gulf Coast Triple Crown allow smaller Blue Marlin (in the 425 to 350-pound range) to be weighed in these tournaments. These fish rarely win any money and killing these small non-winning fish is wasting the resource. Thus, this project assesses what size limit might be the most effective at preventing waste. However, these tournaments are very important from a social and economic standpoint to the Gulf Coast. Therefore, the goal of this project was to aims to find and recommend the best size limit would be to reduce waste; that makes sense from a biological, economic, and social standpoint.

In order to determine the ideal size, the project analyzed catch data provided by the tournaments to examine the relationship between the weight of killed fish versus money won. The catch data is comprised of the weight of every killed blue marlin in each individual tournament, the money each killed blue marlin won (even if it was zero), the length of each killed Blue Marlin, and the number of boats in each tournament. The data were provided by the tournaments for each tournament going back five years. Each tournament generally has a strong, positive relationship of weight versus money won, though there are outliers. In some cases, outliers are due to 'Calcutta' bets. Through Calcutta bets, sometimes a boat can win money from a smaller Blue Marlin that does not place (meaning it isn't 1st, 2nd, or 3rd). However, on average, Blue Marlin that did not place in the top three places, earned significantly less than placing Blue Marlin that did place in the top three places.

To determine attitudes towards current size limits and potentially raising the size limit, interviews were conducted with tournament directors, tournament fishermen, and other prominent people in the industry. A common theme was that most interviewees were in favor of raising the size limit and that the raising of the size limit would not affect tournament

participation and not precipitate negative economic impacts. Some respondents felt that a size limit should have both a length and weight component to it. Finally, many noted a cultural change occurring within the Blue Marlin fishing industry on the Gulf Coast. Fishermen, captains, people, tournament directors, and influential organizations are all becoming more conservation minded.

Due to the variability of weight around the length of the Blue Marlin, interviews, and average weights of fish that win money and fish that do not win money, this project recommends the Gulf Coast Triple Crown should implement a size limit of a minimum of 500 pounds OR 110 inches in length on all killed Blue Marlin in their tournaments. This means if a fish is 110 inches in length, regardless of weight, it can be killed. Conversely, if a fish is 500 pounds regardless of length, it can be killed.

INTRODUCTION:

Blue Marlin are one of the most highly sought-after fish in the ocean from a recreational standpoint for a number of reasons. One of those reasons is their size. Blue Marlin females can reach lengths of up to fourteen feet long and weigh upwards of 1800 pound.¹ Additionally, Blue Marlin are very tough fighters, often fighting for hours and jumping out of the water while hooked. It is quite the sight to see an 800 plus pound Blue Marlin come completely out of the water multiple times throughout the course of a fight. These features along with the pure beauty of a Blue Marlin have brought anglers to Blue Marlin fishing for years. According to the National Oceanic and Atmospheric Administration (NOAA) Blue Marlin are not overfished in the Gulf of Mexico². Blue Marlin are considered the poster child of sport fishing. Due to this status, almost all Blue Marlin fishing is catch and release fishing. There are no regulations preventing them from being killed, the social norm is just to catch and release Blue Marlin. The exceptions to this norm of catching and releasing almost all Blue Marlin are if a Blue Marlin is a “grander”, meaning it weighs over 1,000 pounds; or in specific Blue Marlin fishing tournaments there are “kill divisions”.

These “kill divisions” allow boats entered in the tournament to harvest (boat, kill, take,) a Blue Marlin as long as it meets the minimum size limit put forth by the tournament. Size limits vary from a minimum length, minimum weight, or a combination of the two. However, all five of the tournaments in this study have a size limit of 107 inches minimum length on killed Blue Marlin. These tournaments are a huge spectacle for a few reasons. For one, the payout for a winning Blue Marlin can be upwards of a million dollars, and many boats participate hoping to get a chance at winning that prize pool payout. These boats generate a lot of economic revenue and business for the communities where the tournaments are hosted. Boats often arrive to the marinas for multiple days before the tournament begins and stay for a couple days after it ends. Therefore, boats generate money through fuel purchases (these boats often hold 1,000 or more gallons of fuel), grocery shopping, restaurant dinners for the crews, hotel rooms, and nightly slip fees for boats in the marina. Additionally, many people in these regions/states come to see the weigh ins for these tournaments because many have never seen a fish as big as a Blue Marlin; so, seeing a few large fish brought to the scale and weighed brings many viewers to these tournaments. These people also contribute to the revenue generated by these tournaments

through hotel rooms, restaurant dinners, and gambling (some marinas have large casinos accompanied with them).

Every year the Gulf of Mexico plays host to series of these tournaments known as the Gulf Coast Triple Crown Series. The tournaments stretch across four of the gulf coast states: Cajun Canyons Billfish Classic (Venice, LA), Mississippi Gulf Coast Billfish Classic (Biloxi, MS), Emerald Coast Billfish Classic (Destin, FL), Orange Beach Billfish Classic (Orange Beach, AL), and The Blue Marlin Grand Championship (Orange Beach, AL). These tournaments are traditions, social events, and economic events for the region of the Gulf Coast and the individual states. To place (1st, 2nd, 3rd) in these tournaments, the majority of the time a fish has to weigh at least 450-500 pounds with most fish weighing more than that. However, because of the size limits in the Gulf Coast Triple Crown Series, Blue Marlin are killed each tournament that weigh around 330-425 pounds that will not win any money. Plus, since Blue Marlin fishing is mainly a catch and release fishery, killing a Blue Marlin that is not going to win money is essentially a waste. In an article for Marlin Magazine, writer Andrew Cox details this point. In his article, Cox talks about whether it is time to raise the minimum size limit for killed Atlantic Blue Marlin in these Blue Marlin tournaments. Cox talks about how a team really needs a 500-pound blue marlin to do well in a tournament, and how one can count on one hand the times a small Marlin has actually won a tournament. He states, “Sure plenty of fish were weighed below the mark (500 pounds), but in the majority of the tournaments the top three places were well over the mark (500 pounds)”.² He also goes on to say, “Of those that fell short of 500 pounds and won a tournament, all of them exceeded 400 pounds. In many cases smaller fish in the 300-pound class were weighed that didn’t place nor earned much Calcutta money... that’s a waste in my opinion... a small fish can sometimes win big money but generally a 300-pounder won’t cut it”.² Cox is suggesting what this research is proposing, that there is fishing mortality in these tournaments that in part translates to waste. He is not saying to not kill Blue Marlin in these Tournaments but rather that the tournaments need to use a size limit that focuses the killing of Blue Marlin on those that have a chance to win the tournament and money; while letting the smaller ones go that have no chance of winning and shouldn’t be killed in the first place. Compounding this issue, all killed Blue Marlin are breeding females because the male Blue marlin do not reach bigger than roughly 200 hundred pounds.¹ The size limit of the Gulf Coast Triple Crown Tournaments is 106 inches length or 107 inches length in some tournaments, that

equates to roughly a 350-pound Blue Marlin on average; this equates to a female Blue Marlin that is breeding.¹ Theoretically, this could be easily solved by raising the size limit.

However, the issue of simply raising the size limit is not that simple. If the size limit is too big, then it could cause a decline in boat participation because fishermen would suggest that the limit is too big and their chances of landing a fish that big every tournament are so low that it is not worth spending the money. This in turn could cause a decline in the economic revenue generated by the tournaments. Thus, the change in size limit is designed to help the Blue Marlin population (from a biological sense) to continue to breed and be strong so generations of anglers can enjoy this great fishery. However, the benefits of any change to the size limit should be balanced against potential negative impacts to social and economic aspects of this fishery. Thus, we are trying to find the best size limit from a biological, economic, and social standpoint for the Gulf Coast Triple Crown Tournaments.

METHODS:

Personal Background: I have been a professional fisherman for Blue Marlin in the study site for over eight years. I have fished in some of the tournaments and I have been around many of the boats that fish the Gulf Coast Triple Crown. Due to this experience, I have fished in rough conditions and know what it takes to land fish in these particular scenarios. In the next few sections, there are multiple statements with respect to weather and its effects on fishing and the tournament scene in general. This comes from my own personal experience and are referenced cited accordingly. The description for the tournaments in the study site also come from my own professional experience. Direct numbers such as exact payouts are cited accordingly.

Study Site and Background:

The study site for this project is the Gulf of Mexico, stretching from Louisiana up to roughly Destin, Florida. The Gulf Coast Triple Crown Tournaments take place in the Federal waters off of these Gulf Coast States. This section begins by describing each of the Gulf Coast Triple Crown Tournaments (not all of the tournaments are the same) and then moves on to describe 'Calcutta Bets', an important economic consideration driving fishing behavior.

Cajun Canyons Billfish Classic (CCBC): (Personal Observation) The Cajun Canyons Billfish classic is hosted out of Cypress Cove Marina in Venice, Louisiana. The Cajun Canyons tournament is the closest tournament to the best fishing in the Gulf of Mexico because it allows most of the boats to access the oil rigs (fishing destinations) in both Mississippi Canyon and Green Canyon. However, the tournament is one of the smaller tournaments in the Gulf Coast Triple Crown because the Marina cannot accommodate more than about 50 boats per tournament due to marina space at the venue. Additionally, the tournament is usually held the last weekend in May so the weather is usually fair but a decent amount of the time weather can be unpredictable at this time of year. Bad weather can lead to boats dropping out and in bad weather it makes it harder for a boat to land a bigger fish because everything that is already normally hard, is even harder in 8 foot seas (Personal Observation). Also, because the tournament has fewer boats in the water, the odds of catching a big fish go down just because there aren't as many boats targeting the fish as a bigger field would have. Therefore, it would not be unlikely to see some smaller Blue Marlin to be weighed in this tournament and place/win

money. Finally, because of the smaller number of participants in this tournament, the payouts for these fish will not be as big as they would be in other tournaments.

Mississippi Gulf Coast Billfish Classic (MGCBC): (Personal Observation) This tournament is hosted out of Biloxi, Mississippi at the Golden Nugget Casino and Hotel Marina. This tournament is the biggest tournament in the Gulf Coast Triple Crown Series due to its ability to host the most boats in its marina, and it also offers the highest overall payout (some other tournaments might have individual boats that win more money than at the MGCBC but the MGCBC has the most overall money won or prize pool). Boat participation in this tournament is often from 90 to 120 boat range with the prize pool being roughly two million dollars. Because of a luxury element of the venue, there is often an audience of spectators in attendance to see the weigh in of the fish. Because of the number of boats fishing this tournament, there are often many fish killed in this tournament and big fish are often killed as well. Additionally, because of the number of boats in the tournament, there is often a lot of money in the Calcutta bets, making it possible for smaller fish (such as 400-pound fish or 4th and 5th place fish) to win a high amount of money in this tournament. This tournament also upgraded its size limit from 100 inches to the 107 inches in the for 2017 and future tournaments.

Emerald Coast Blue Marlin Classic (ECBC): (Personal Observation) This tournament is hosted out of Sandestin Marina in Destin, Florida towards the end of June. ECBC is the 2nd biggest tournament in the Gulf Coast Triple Crown in terms of participation. Also, this tournament has an overall payout around 1.9 million³ and with fewer boats it can mean higher individual payouts for winners. Due to the high number of boats in this tournament, very big fish are often weighed at this tournament. Also, this tournament is the furthest tournament geographically from the good fishing grounds in the Gulf Coast Triple Crown Series. Therefore, not as many fish are weighed because all the boats cannot reach the best grounds and it is possible for only one big Blue Marlin to be weighed. Due to this, all of the leftover money from the other marlin categories (2nd place, 3rd place) can be put into that one fish if the only one fish is weighed. The result is the team could win a very high sum of money for one fish that looks like an outlier in the data.

Orange Beach Billfish Classic (OBBC): (Personal Observation) This tournament is hosted out of The Wharf Marina in Orange Beach, Alabama. This is the first tournament of the year for the Gulf Coast Triple Crown and it is also the smallest tournament in terms of boat participation with

roughly 25-40 boats participating. This is because it is held in the first week in May and many boats are just making it back from fishing the Caribbean and are not ready to fish the tournament yet. The marina itself can play host to more boats. Thus, because of the boat participation, the payouts for winning fish will be smaller. The weather at the beginning of May in the Gulf of Mexico is unpredictable and can often be bad during this particular tournament (Personal Observation). Again, when there is bad weather, it makes landing a bigger fish that much harder and it results in smaller fish being brought to the scale. This tournament is also pretty far away from the normal fishing grounds, it is not so far that it makes certain spots out of reach but if you couple distance with bad weather, many boats just will not make the trek to further spots. The combination of all these factors allow for relatively not many fish to be killed in this tournament, and the fish that place and win can be smaller.

Blue Marlin Grand Championship (BMGC): (Personal Observation) This tournament is hosted out of The Wharf Marina in Orange Beach, Alabama. The BMGC is the last tournament in the Gulf Coast Triple Crown Series as it is held in the middle of July. Due to this, this tournament often experiences some of the best weather of the summer. This great weather often results in some big blue marlin being weighed in the tournament and a higher number of killed fish. This tournament caps its boat participation at 60 boats, however, it has an overall payout of roughly 1 million dollars, so the money is there for big winnings. Of all of the tournaments, this tournament has the best weigh-in experience of the Gulf Coast Triple Crown Series. It is often referred to as “The Greatest Show in Sportfishing” and a “Rockstar Weigh-in”. This tournament offers a huge live audience, Emcee’s, live bands, and this large shrine that the fish are hung and weighed from. This creates a big incentive to weigh a fish in this tournament because it offers a chance to experience “dock swag” at a level that just doesn’t exist in some of the other tournaments. Thus, this could result in a team weighing a fish that may be small and not have a great chance in winning because they can experience this. Also, this tournament gives more money back to its participants for winnings than other tournaments so some teams may bet more in the Calcutta in the BMGC than in other tournaments and could allow for a smaller fish to win money as well. Also, this tournament tries to be on the front end of conservation by making every overall tournament placing after first place a combination of both release points and killed fish points. Basically, teams (boats) get points for both killing and releasing a fish. In most tournaments, 1st, 2nd, and 3rd place in the overall tournament goes to the three biggest weighed

fish in the tournament. The blue marlin grand championship does this for 1st place but makes 2nd-4th place a combination kill and/or release points to try and incentivize boats to release smaller fish. However, sometimes boats can release multiple fish and kill a smaller fish to go along with their release points in order to garner more points. Thus, a smaller fish can still be incentivized to be killed.

Calcutta Bets:

Additionally, the betting involved in these tournaments known as Calcutta bets play an essential role in determining size limits. Boats receive payout money for placing 1st, 2nd, or 3rd with a Blue Marlin. However, boats can also win money from what is called Calcutta bets. Calcutta bets are level bets essentially. So, a team bets at different money levels (\$500, \$1,000, \$2,000, \$10,000 for example) then the Calcutta pays the team for their specific place in those levels. For example, the boat that caught the biggest Blue Marlin in the tournament may not have bet in the Calcutta money (since it isn't required) and the boat that caught the second-place fish did enter the Calcutta bets; the boat that caught the 2nd place fish would now be in first place in all the Calcutta categories they paid into and would be paid accordingly (usually 60% of pot for first). What this allows for is the potential for a 4th place smaller fish to win money from time to time which is an argument of some fishermen to keep the size limit low. Thus, the Calcutta bets play a role when talking about size limits.

Data Collection

This project uses different types of data and methods. First, it includes catch data from the tournaments of the Gulf Coast Triple Crown including, for each tournament the number Blue Marlin killed, the weight of Blue Marlin killed, the length of Blue Marlin killed (if provided), the number of boats participating, and the monetary payouts for each individual killed Blue Marlin (even if that individual won no money). Data were collected going back five years. In addition, 10 semi-structured interviews with tournament directors, tournament fishermen, and other people surrounding the industry (such as writers in Marlin Magazine) were conducted.

Data were analyzed to determine the maximum, minimum, and average weights of all the Blue Marlin killed at each individual tournament over the past five years to give a baseline (reference point) for each individual tournament as well as the Triple Crown Tournament Series as a whole. This baseline will provide a reference point to help compare future numbers against, so it can be seen what the effects of potentially implementing a size limit would be if the tournament would want to change the size limits again. The next analysis will be looking at each time a Blue Marlin in a tournament in the Gulf Coast was killed and weighed under 450 pounds. Secondly, the project will be observing how many times that fish won (i.e. 1st, 2nd, 3rd) and if it placed 4th, the project will look at the money the fish won from that sole payout. What sole payout means is in these tournaments you can win money through a multitude of different categories such as killed blue marlin, catch and release blue marlin, killed tuna, etc; so, for this analysis the project will only focus on the winnings garnered by this team for the kill of the Blue Marlin. This is important because teams win money from Calcutta bets. By determining the real worth of the fish, it gives the project another metric to look at. Additionally, for each tournament, the project will look at the Blue Marlin that are weighed and do not win any money and observe their weights. Another metric will measure the average weight of the 3rd place, 2nd place, and 1st place blue marlin winners of each tournament over the time scale to again give us a metric of what size fish are actually winning tournaments so we can improve the size limit to prevent waste through the killing of smaller fish. This data and analysis will be represented in the forms of tables and some line/bar graphs. The point of the interviews is to get social aspect surrounding the issue. Interviewees were asked what they thought about the current size limits, if

they were in favor of changing the size limits now or in the future. Interviewees were asked about what they thought the impact would be on tournament participation if the size limits were changed. Interviewees were also asked if they have seen a change in the industry, essentially if people around the industry were becoming more conservation oriented than in the past. If all the fishermen suggest they want an increase in size limit or vice versa, that is something the project needs to consider.

RESULTS & DISCUSSION:

In this section, graphs and tables are presented for each tournament showing different types of data analysis done for each tournament. Directly following each graph or table is an explanation of the overall patterns and particular points of interest from the data. Following these explanations, further discussion for each graph is written to explain the why certain findings and trends are the way they are. This discussion is based on some personal observation but also on interviews collected about the graphs and tables as well. All of the interpretations are my own, unless otherwise noted in the text.

Graph & Table Analysis & Discussion, does Bigger mean More Money?:

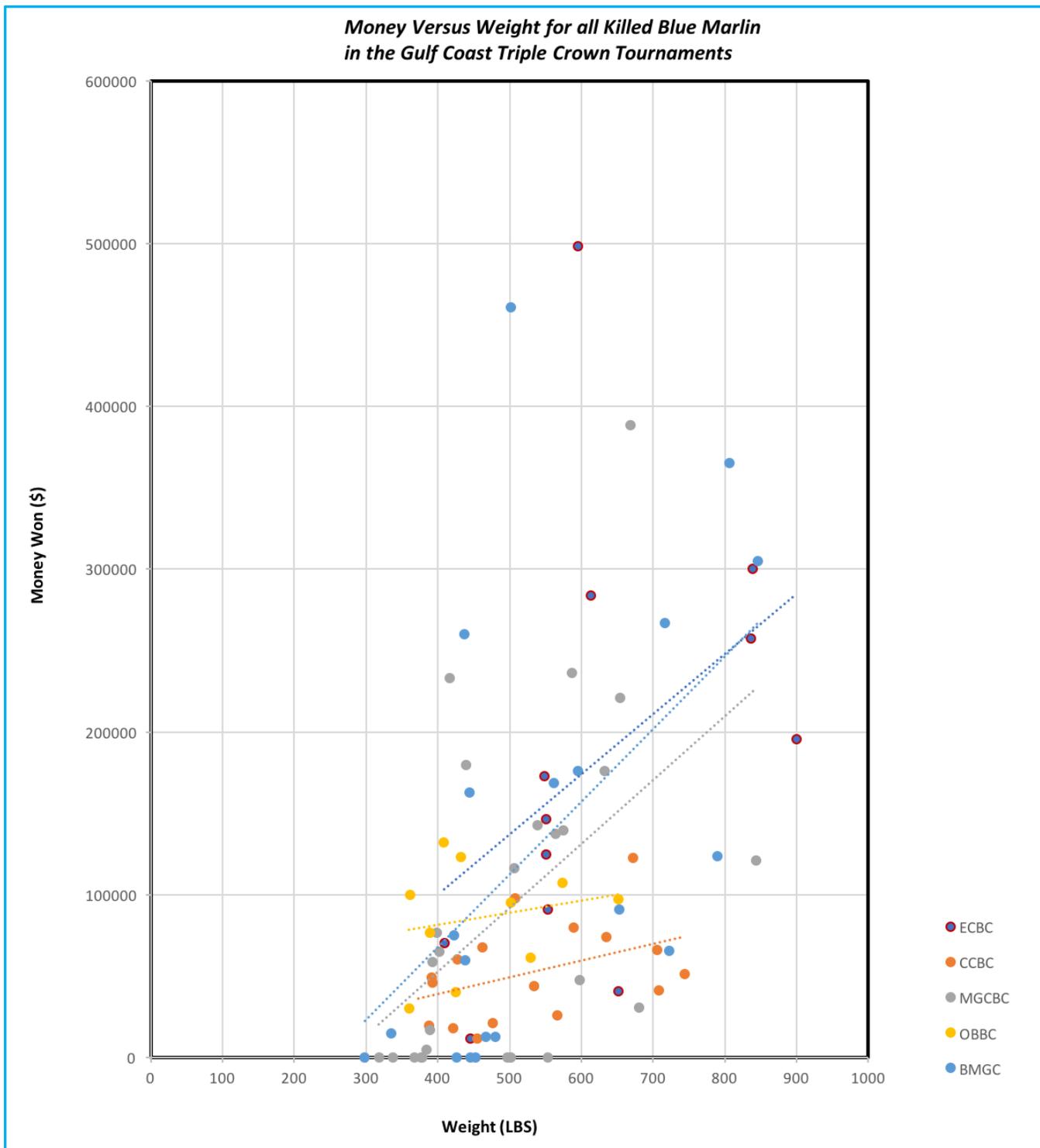


Figure 1: All killed Blue Marlin weights versus money won (if any) for all of the Gulf Coast Triple Crown Tournaments from 2013-2017. (2009 & 2012 data used for Cajun Canyons)

This graph shows every Blue Marlin Killed in the Gulf Coast Triple Crown Tournament Series (all tournaments) from 2013 to 2017 (with data being from 2009, 2012-2016 for CCBC) and how

much the Blue Marlin weighed versus the money that it collected (if any). The first thing to notice when looking at this graph is that the data are not linear, though there are linear trend lines in the graph to show the general relationship for each tournament. In this graph, there are three tournaments that have very similar trend lines with relatively steep slopes of weight versus money won: The Emerald Coast Blue Marlin Classic, the Mississippi Gulf Coast Billfish Classic, and the Blue Marlin Grand Championship. However, there are two smaller tournaments that have relatively less steep trend lines (in comparison to the other tournaments): The Cajun Canyons Billfish Classic and the Orange Beach Billfish Classic. This suggests the relationship of increasing weight (size) to increasing money won is stronger in Emerald Coast, Mississippi Gulf Coast, and Blue Marlin Grand Championship than it is in Cajun Canyons or Orange Beach Billfish Classic.

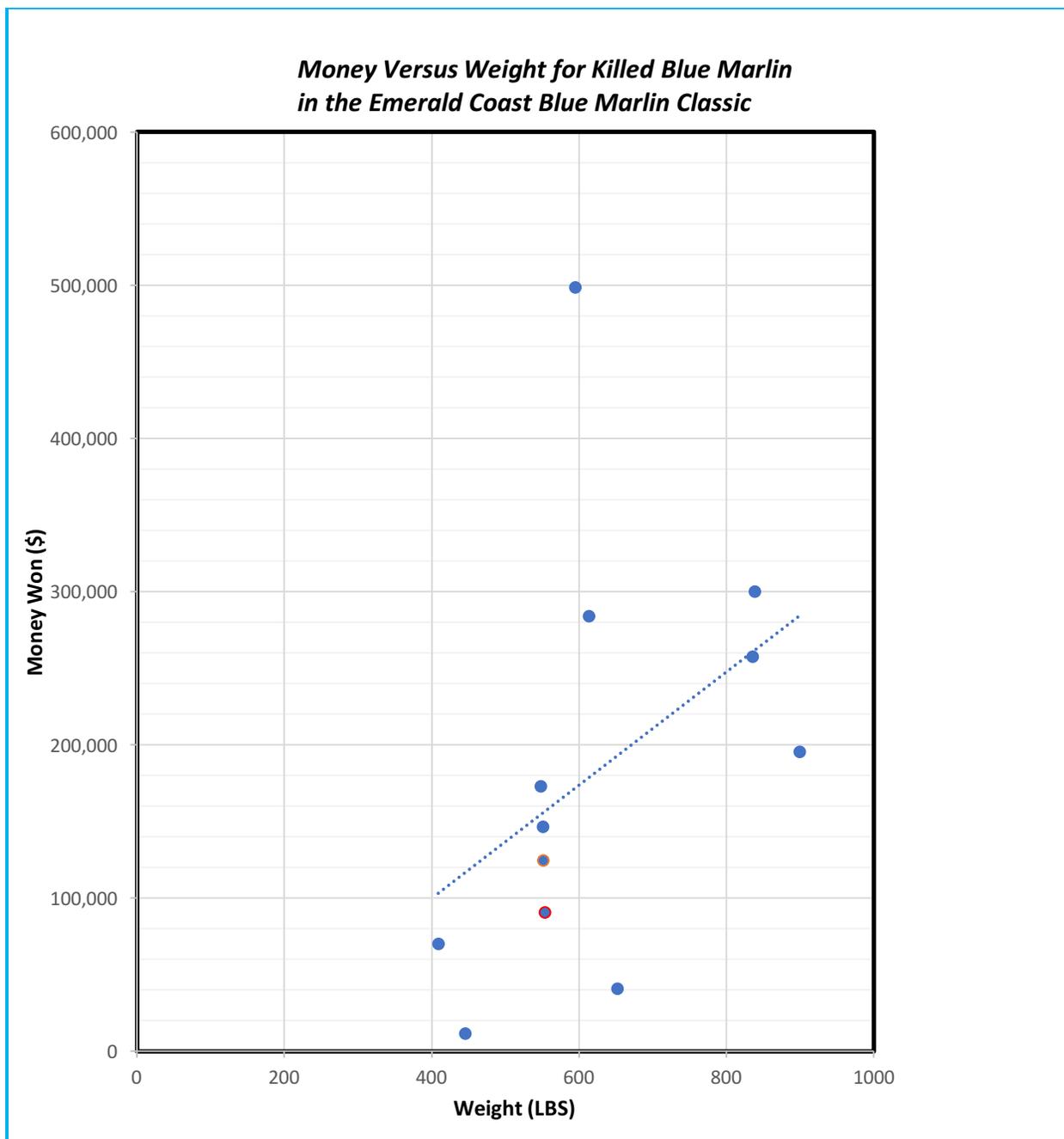


Figure 2: Emerald Coast Blue Marlin Classic Money vs. Weight³

This graph shows the relationship of money won versus weight solely for the Emerald Coast Blue Marlin Classic from 2013-2017. Though not linear, there is a positive relationship between weight and money won. There is a large outlier data point with a 594.9-pound Blue Marlin (caught by the boat Reel Worthless in 2014) that garnered nearly \$500,000 dollars, almost \$200,000 dollars more than the next highest earning fish in the tournament over the past five years. Another data point exists on the other end of the spectrum. In 2016 there was 652.2-

pound Blue Marlin caught by the boat The Kracken. Despite this being a large fish, it only earned a \$40,000-dollar paycheck, the second smallest payout in the tournament in the past five years. Also, the smallest payout in the tournament (\$11,610) went to the smallest fish killed in the tournament over the past five years at 445.8 pounds, which would be in line with the tournament having a strong relationship between a bigger fish earning more money. Finally, this tournament has no real small fish that have been weighed in the past five years, i.e. fish below 400 pounds and in the 300-pound range.

When looking at Figure 2, there is an outlier point on the graph of a single Blue Marlin at 594.4 pounds earning a \$498,000 paycheck, almost \$200,000 dollars more than the other highest payout. The reason this exists is because this fish was the only fish that was weighed during the tournament that year. When only one fish is weighed, all the “killed Blue Marlin prize pool money” (i.e. 1st, 2nd, & 3rd) as well as all the Calcutta money from the levels that boat bet into, is all pooled together into one pot, making the payout very high. However, this point is not really that big of an outlier for a few reasons. This tournament is out of Destin, Florida and is very far east of the common fishing grounds and some boats are limited in how far they go and have to try different fishing strategies in different places than in the normal ones. So, if the information says the fishing is going to be best in West Green Canyon (off the coast of Louisiana), only a certain number of boats will be able to take advantage of that. Therefore, it’s not out of the ordinary for this tournament to only kill one or two fish (although it doesn’t always happen). This is why there are not as many data points (fish killed) as in some of the other tournaments, even though the participation/payout is high. This also happened in 2013 and the fish won nearly 300,000 dollars so the difference could be due mainly in part to an increase in boat participation. Additionally, there are two data points representing the two Blue Marlin killed in the 2017 tournament, that earned \$90,600 (Don’t Blink, 1st place Red Marker) and \$124,785 (Team Supreme 2nd place Orange Marker) respectively. These amounts are somewhat in the middle for a 1st and 2nd place fish in this tournament. This is because during the 2017 tournament there was a large tropical storm the week before the tournament which kicked up waves to roughly 6-10 feet for the whole weekend and caused roughly half of the boats (and a lot of the money) to drop out of the tournament. Thus, if all the boats would have stayed in the tournament, these fish would have received higher payouts. Also, there is a 652.2-pound blue marlin from 2016 that only won 40,000 dollars; this is due to the team not betting heavily in the

Calcutta. This is actually how that same year a 409-pound fish won 70,000 dollars. The team that caught this 3rd place, 652.2-pound blue marlin, did not bet heavily in the Calcutta bets. Thus, the 409-pound Blue Marlin became the 3rd place fish in the Calcutta bets in which the team bet and took home a decent sum of money.

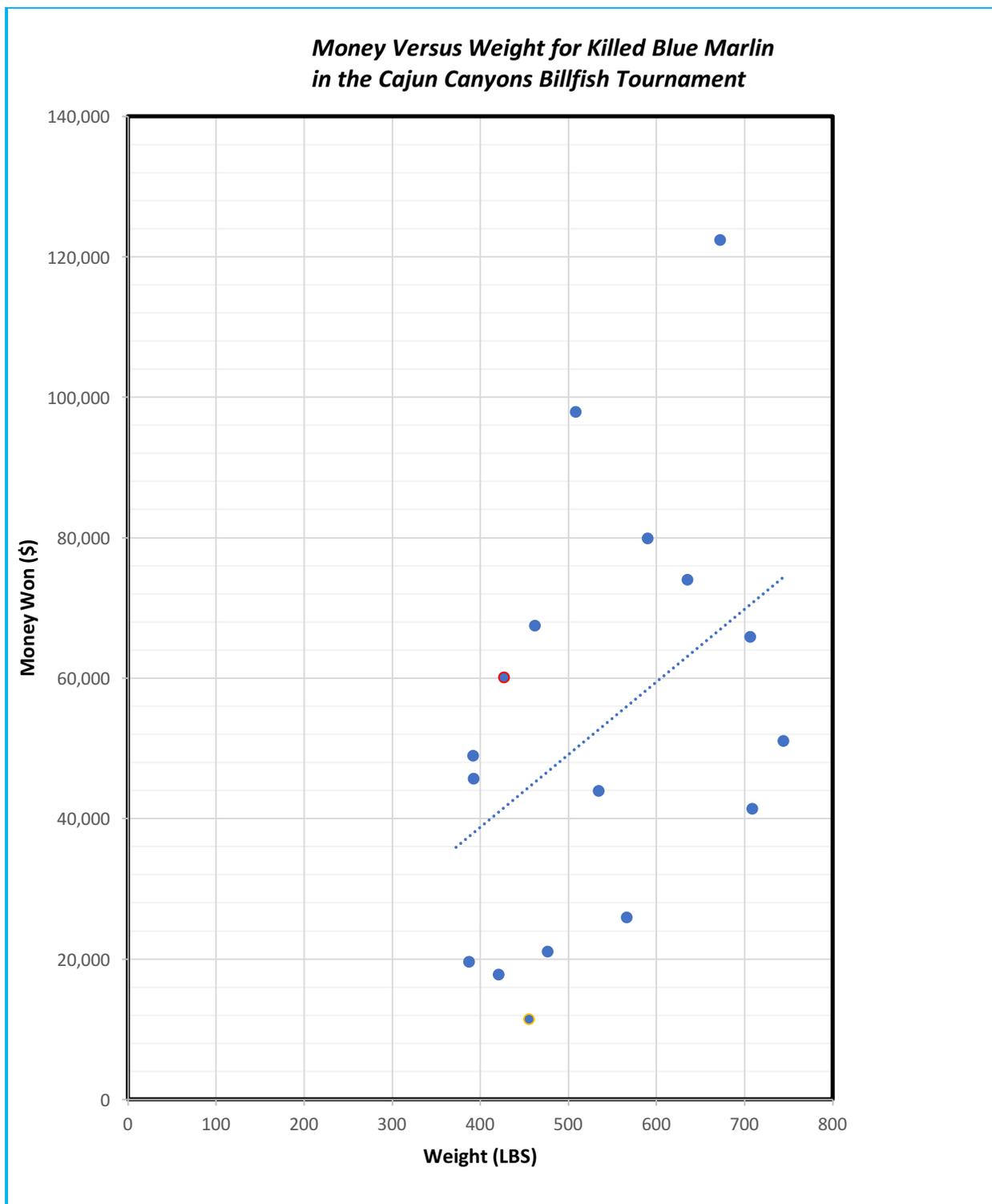


Figure 3: Cajun Canyons Billfish Classic Money vs. Weight⁷

This graph shows the relationship of money won versus weight of killed Blue Marlin solely for the Cajun Canyons Blue Marlin tournament from 2009, 2012-2016. There are no data from the

2017 tournament because it was canceled due to extremely poor weather conditions.

Additionally, this graph shows there are a high amount of data points (killed Blue Marlin) in the 380-450 pound range; with some of these smaller fish getting high payouts, such as the 426.6-pound Blue Marlin that earned a \$60,120 dollar payout (Red Marker). This graph shows the payouts in the tournament are much smaller across the board than in the other tournaments. Finally, the lowest earning (\$11,475 Orange Marker) fish for this tournament over the past five years was not the smallest fish weighed, but rather a decent size fish at 454.7 pounds. Also, there is one fish that weighed in 2013 at 372 pounds and it is one of the fish that was caught that year, however there is no data on how much money it won. Since there is no data on how much money this fish won, it is not included in the graph. However, it would could have changed the data and trend line and must be mentioned.

The first thing that jumps out in Figure 3, is the change in the appearance of the data separately from the main graph (figure 1). The slope of the trend line for a tournament like ECBC is much steeper than the Cajun Canyons tournament on the main graph because ECBC has more boats, participants, and money so each fish will generally win more than a fish at Cajun Canyons. However, when plotting the Cajun Canyons data alone, the trend line is much steeper and is very similar to the trend line of the ECBC data. This means that even though the money in Cajun Canyons is not as much as in other tournaments, a similar relationship exists between weight and increased money. Also, the three biggest fish that were weighed in the tournament over the past five years all had relatively low payouts. This is because these boats did not pay heavy into the Calcutta bets and therefore have lower winnings. Yet, despite all of these different factors, the trend line is still steep and comparable to ECBC. This tells me the inverse of the relationship is strong, suggesting that killing a smaller fish, wins a team much less money. Although, in this tournament there are a few more fish killed from the 390-460 pound range. This exists for a potential couple of reasons. For one, there are fewer boats in these tournaments so fewer fish are caught and potentially a smaller fish can take a higher placing than in other tournaments. Additionally, this tournament takes place in late May when the weather is inferior to later in the summer. When the weather is bad it makes landing a big fish that much harder than it already is, boats come back in early, or don't run as far, so the odds of landing a big fish just go down. The reason there is a discrepancy such as a 426.6-pound Blue Marlin that earned a higher payout in the tournament at \$60,120-dollar payout while the lowest earning (\$11,475) fish

for this tournament over the past five years was not the smallest fish weighed, is due to Calcutta bets. The team with the 426.6-pound Blue Marlin bet more heavily and were compensated because of it.

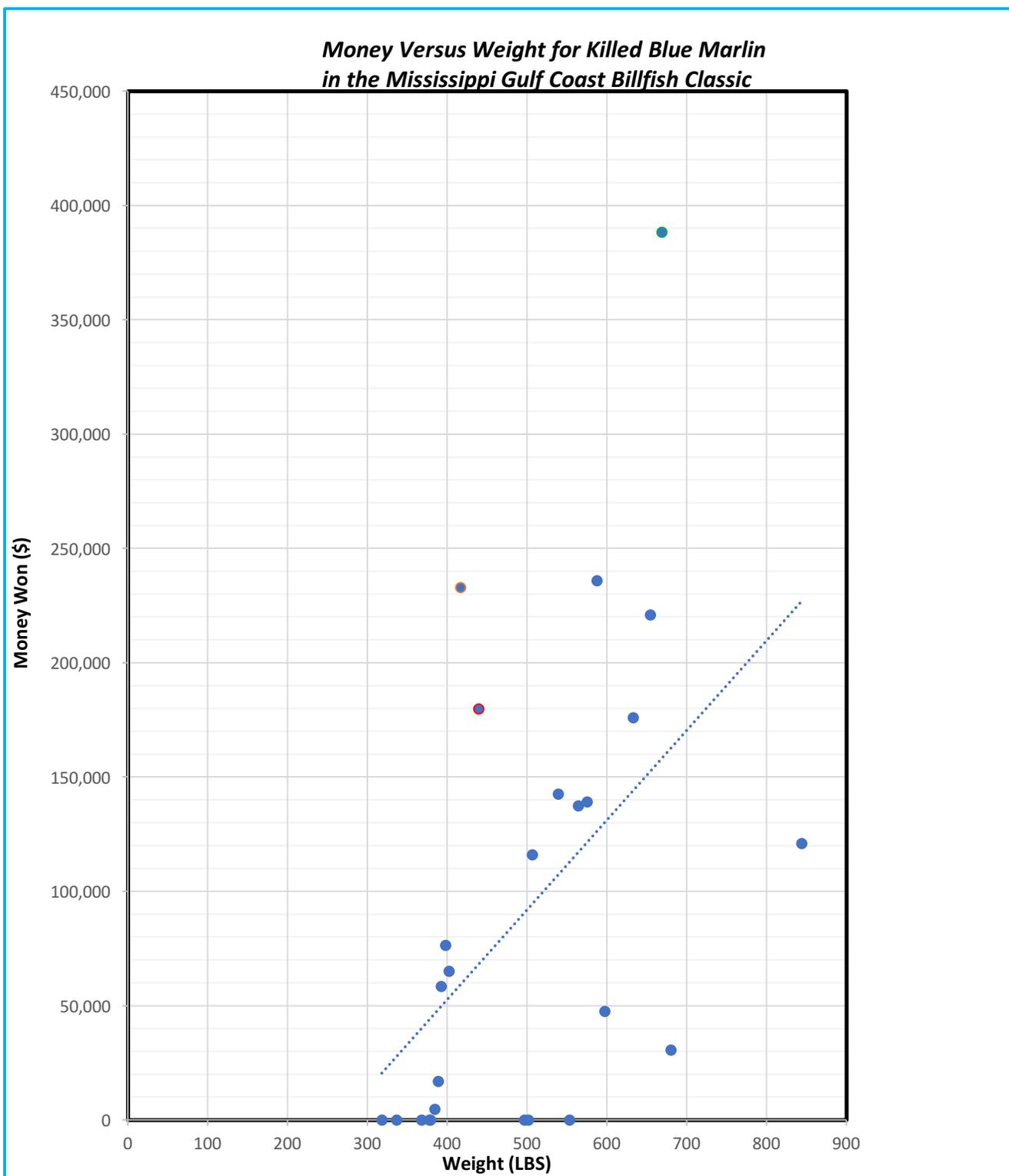


Figure 4: Mississippi Gulf Coast Billfish Classic Money vs. Weight⁸

This graph shows the relationship of money won versus weight in the Mississippi Gulf Coast Billfish Classic from 2013-2017. The data on this graph shows a very strong positive relationship between weight and payouts. The highest payout for this tournament was for a Blue Marlin at 668.77 pounds caught in 2017 by the boat Aries, and it earned a paycheck of \$388,425 dollars (Green Marker). This payout is more than roughly \$150,000 dollars higher than the next nearest payout. Also, the largest fish caught in this tournament in the past years weighed in at a massive 843.7 pounds but it earned a paycheck that was below the trend line though still a \$121,010-dollar paycheck. Additionally, there are two fish at 416.2 pounds and 439 pounds that earned large payouts at \$232,875 (Orange Marker) and \$179,825 dollars (Red Marker) respectively. These are both large payouts for smaller fish. Also, there are numerous data points at the bottom of the graph representing Blue Marlin that were killed and did not win any money. Finally, this tournament has many data points (killed Blue Marlin) throughout the 300-pound range and in total has a high number of harvested Blue Marlin compared some of the other tournaments in the Gulf Coast Triple Crown.

The Mississippi Gulf Coast Billfish Classic (MGCBC) is the biggest tournament in the Gulf Coast Triple Crown with the most boats participating and the highest overall payout (see above). The highest earning fish in this tournament was at \$388,425 dollars with a 661-pound first place fish in the 2017 tournament. The reason that data point is higher than most of the other data points is because there was a decent increase in boats fishing that year which helped raise the payout. The participation is always the highest in this tournament, it just so happened that the tournament had another increase in participation this past year which raised more money. I hypothesize that future years will have winners at this level as well. Another interesting point is there are numerous data points (killed Blue Marlin) around the 300-390-pound range. After an interview with fisherman who fishes this tournament consistently, it was made clear this is because the until last year the tournament had a 100-inch size limit on blue marlin, which allowed these smaller Blue Marlin to come in. Many of these fish won no money, but were brought in because there is usually a big live audience around this tournament and weighing a blue marlin gives fishermen a lot of “dock swag”.

There a few data points (killed blue marlin) that need further examination. For one, there is a data point at 416.5 pounds that won 232,875, the third highest payment in the tournament over the past five years. This fish placed 4th place in the 2016 tournament and weighed less than

the tournament's average weight for a killed blue marlin over that year span, which was 500.7 pounds. So how did this fish win all this money? As confirmed by interviews, this was due to the team (Breathe Easy) betting very heavily in all of the Calcutta levels and the teams whose fish placed in front of them not betting into all the Calcutta levels. Therefore, the fish was awarded a heavier prize pool however. Finally, there is a data point representing a fish from 2013 that weighed 439.1 pounds and won \$179,825 dollars. Another example of a small fish winning a lot of money. However, in this case, that particular fish placed first place. This again is more of an outlier point because the weather in 2013 for this tournament was absolutely horrible (8-10 foot seas) and again that horrible weather leads to smaller fish being killed (hence why all the killed blue marlin that year were less than 440 pounds) and winning more money than usual. Taking those data points into consideration, what is really interesting is that despite these outliers, the trend line for this tournament still has one of the biggest positive & steepest slopes of all the tournaments.

Thus, the data suggests that it isn't worth it to just kill a fish if a team has bet heavily or in case you might get lucky, because the data shows (with a couple exceptions) a team won't win money that way. The bigger the fish, the more money. From an interview, it has been made clear that the tournament recently raised their size limit to 107 inches minimum. In practice over the 2017 tournament, no Blue Marlin was brought to the scales that weighed less than 500 pounds (a total of five Blue Marlin were weighed). Thus, this increase in size limit may have kept smaller non-winning Blue Marlin from the scales for one year; it will be interesting to see how this increase plays out in the future. Additionally, this tournament had its highest year of participation after it increased its size limit, which is something to take into account.

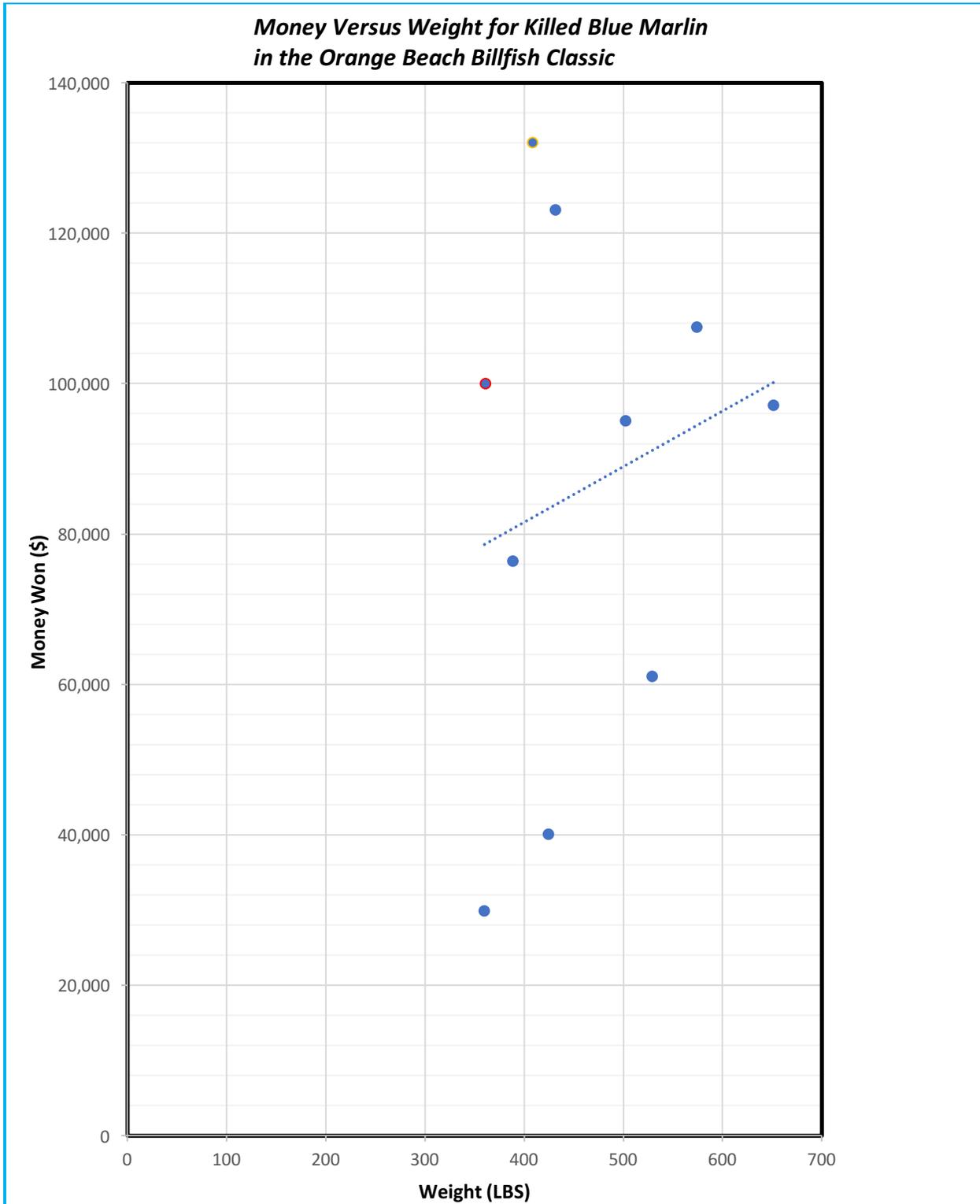


Figure 5: Orange Beach Billfish Classic Money vs. Weight⁹

This graph shows the relationship of money won versus weight for the Orange Beach Billfish Classic (OBBC) from 2013-2017. The OBBC has the trend line with the least steep slope of all the tournaments. However, the slope of the trend line is much steeper here on the separate individual graph than it is on Figure 1. The payouts in this tournament are much smaller like the ones in the Cajun Canyons Billfish Classic. This tournament has the fewest killed Blue Marlin over the time period. Additionally, of those killed Blue Marlin, the majority of them are roughly 450 pounds or smaller and these small fish are earning some of the higher payouts (including the highest as well) in the tournament. For example, the 360.8-pound blue marlin earning a payout of \$100,000 dollars (Red Marker) and a 408.2-pound Blue Marlin earning the highest payout in the tournament over the last five years at \$132,100 dollars (Orange Marker). Yet despite this, the trend line is still steep indicating a strong relationship that the bigger the fish is, the more money it is going to win. Also, it must be noted from this data, that in 2016 a 771-pound Blue Marlin was killed in this tournament but made it to the scales 2 minutes after the deadline for weigh-ins and therefore did not qualify. This Blue Marlin would have won first place and could have potentially made a high payment which would affect the trend line.

Due to the Orange Beach Billfish Classic having a trend line with a less increasing slope compared to other the tournaments, it suggests the correlation that a bigger fish leads to a bigger paycheck is not as strong in this tournament. This is due to a few factors. For one, this is the first tournament of the year and it happens very early in the month of May; thus, many of the kids of these families are not out of school yet (this tournament is held before Memorial Day) so weekends are not as free for families to take four or five days off to fish in the tournament or attend the tournament. Also, many boats are coming back from the Caribbean and are not ready to fish yet. Thus only 25-40 boats fish this tournament every year meaning there is not a lot of money in the tournament nor is there many boats to target fish so the chances of landing a bigger fish are lower. Plus, with fewer boats, not as many fish are going to be weighed. Additionally, the weather for this tournament is usually poor due to early May having less predictable weather than later in the summer months. This poor weather, as talked about previously, makes it harder to land bigger and more fish. Thus, is another reason why we see fewer Blue Marlin and smaller Blue Marlin killed in this tournament.

As for why we see some of these smaller fish earning big paychecks such as the 408.2-pound Blue Marlin earning \$132,110 dollars and a 360.8-pound Blue Marlin earning \$100,000 is

due to a combination of the factors described above as well as the effects caused by these factors. So, for the example of the 408.2 Blue Marlin, that Blue Marlin was the only fish that was weighed that year in 2013. Therefore, all of the “Blue Marlin Kill Money” as well as the 1st place money in any level of Calcutta bet that team bet into went to the fish and it earned a higher payout. Similarly, in the case of the 360.8-pound Blue Marlin, it placed second that year in a year where only two fish were killed. Therefore, more money again was put into the pool allowing the team to win more money. So, it is possible to win a good amount of money in this tournament with a smaller Blue Marlin. However, after an interview with member of the board for the OBBC tournament, the gulf is seeing a new shift in people starting to fish in the winter for Blue Marlin. People always thought that Blue Marlin left during the winter, but because of this new-found knowledge, many more boats are starting to fish in the Gulf of Mexico through the winter and are ready for this early season tournament. Thus, they are seeing more tournament participation and this increase could have an effect on the data in the sense that more fish could be caught so smaller fish might begin to not win the hefty sums we see in the graph.

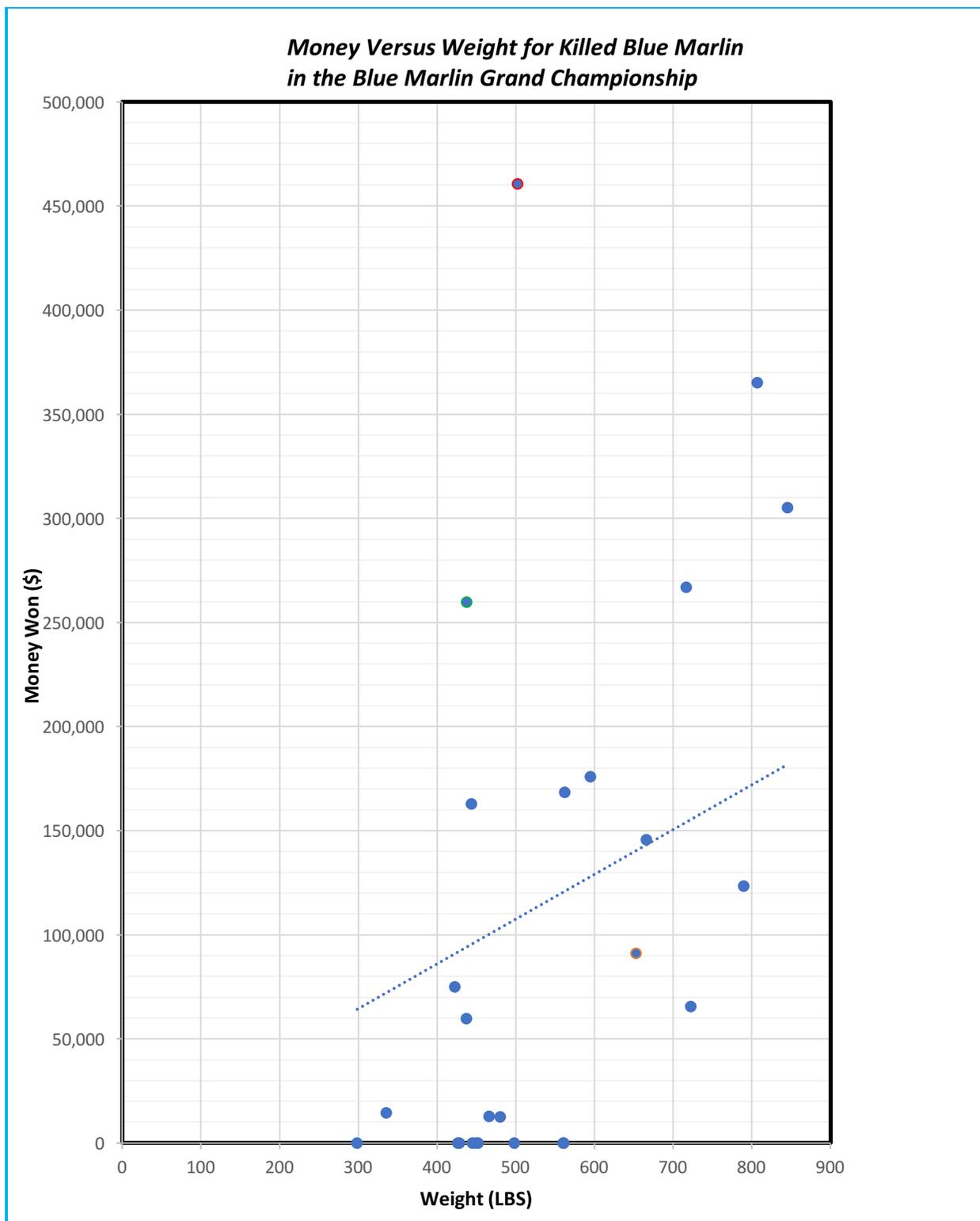


Figure 6: Blue Marlin Grand Championship Money vs. Weight¹⁰

This graph shows the relationship between money won versus weight of killed Blue Marlin for the Blue Marlin Grand Championship from 2013-2017. The data from this graph for the Blue

Marlin Grand Championship immediately indicates the tournament has a trend line with a very steep slope, suggesting there is a very positive relationship between weight of a killed fish versus money won. This is interesting when there are three data points (killed fish) way under the trend line with weights of 652.2, 722.2, and 789.8 pounds. The highest earning Blue Marlin for this tournament over the past five years earned a massive \$460,845 dollars, roughly \$100,000 dollars higher than the next highest payout. The fish for this paycheck was a decent fish at 502 pounds but it is in the middle of the data points as far as weights of killed Blue Marlin, which is interesting. This tournament has a very high number (highest of all the tournaments) of killed Blue Marlin over the time period. Additionally, there are a lot of Blue Marlin at multiple different weights that did not earn a payout of any money in this tournament, especially seen at the 400 to 450-pound range. However, there is a Blue Marlin the weighed 437.4 pounds that earned a paycheck of \$259,943 dollars (Green Marker), much higher than many fish bigger than it earned.

When examining Figure 6 about the Blue Marlin Grand Championship, the 652.2-pound Blue Marlin took 3rd place in its tournament in 2016 and received a payout for 90,000 for 3rd place (Orange Marker). This is actually still a high payout for third place; the team was just unfortunate that two larger Blue Marlin were caught but that is still a high payout for their placing. For the other two data points a similar situation happened in 2013 where an 845.8-pound blue marlin (Alabama State Record) took first place and bumped the two other 700-pound fish down, which caused them to receive lower payouts than they normally would. For the most part, a 700-pound fish is going to win you a tournament, these teams were just unfortunate that year that three massive fish were weighed. But, despite these very large fish being below the trend line there still is a steep slope. For the outlier point of the 502.0-pound blue marlin from 2017 that earned 460,000 dollars (Red Marker), this happened because the team bet high in the Calcutta and this tournament gives more money back to the participants than most other tournaments in regard to the base winnings and the Calcutta bets. Thus, it is possible if the field of boats bets well (and the winner does too) to win this much money in the tournament. The numerous data points (killed Blue Marlin) in the 400 to 450-pound range that win no money suggests that the likely hood of a winning a lot of money with this size fish is low even if a team has bet heavily in the Calcutta. There is an exception with a blue marlin from 2015 that weighed 437.4 pounds that won 259,943 dollars by betting well in the Calcutta. This tournament also has

the most killed Blue Marlin of any tournament in the Gulf Coast Triple Crown in the past five years, which is surprising because it's only a medium size tournament in terms of boat participation.

Also, this tournament tries to be on the front end of conservation by making every placing after first place a combination of both release points and killed fish points. Crews get points for both killing and releasing a fish. In most tournaments, 1st, 2nd, and 3rd place goes to the three biggest weighed fish in the tournament. The Blue Marlin Grand Championship does this for 1st place but makes 2nd -4th place a combination of kill and/or release points to try and incentivize people to release smaller fish. However, people are taking advantage of this and are killing smaller fish to go along with their release points. After an interview with someone from the Billfish Foundation, they made the point that the idea the tournament has is the right idea; but the way the tournament structures points, it still incentivizes a boat to kill a fish if they already have a couple of releases, rather than releasing that fish as well. Concluding, the tournament has the right idea, but the point distribution is not executed as well as it needs to be in order for it to be effective at truly incentivizing boats to release smaller fish.

Finally, another reason a lot of marlin are killed in this tournament is this tournament has arguably the best weigh-in scene of any tournament in the United States, it has thousands of live viewers, announcers, sunsets, parades, lights, live band and huge party. It is often described as a "rockstar weigh in" and the "best show in sportfishing"⁶. Thus, there is a lot of incentive for dock swag because there is not a lot of teams that don't want to experience weighing a fish in that environment and being cheered on by all those people.

The trend lines combined in the first graph and separated the tournaments a bit. The separation of the trend lines for these tournaments in this fashion makes sense because the three tournaments with higher slopes are the biggest of the five tournaments. They can play host to more boats in their particular tournaments, which in turn leads to more entry fees, more Calcutta, and thus more overall prize pool. Thus, a killed fish in one of these tournaments (especially a large one) is going to garner a higher payout than in a smaller tournament. By the same token, the smaller tournaments such as the Cajun Canyons Billfish Classic and Orange Beach Billfish Classic do not have the same marina space that these bigger tournaments have and can therefore not hold the same number boats. Thus, the payouts in these tournaments are always going to be

smaller than these other bigger tournaments. Put quite simply, an 800-pound fish in the Cajun Canyons will win less than an 800-pound fish in Emerald Coast (assuming all bets equal). However, when each tournament was plotted individually, the trend lines for all the tournaments looked much more similar despite having drastically different payout scales. Each tournament has a positive trend line suggesting a strong relationship that a bigger fish earns higher money payouts. None of the tournaments have linear data so there are variations. This makes sense because there is some variation in the tournament process itself; through things such as changing weather and betting small fish are going to win big money sometimes and that is what is represented by this variation. Some tournaments such as ECBC had bigger fish weighed than others such as OBBC and some tournaments had fewer fish weighed in general such as OBBC whereas MGCBC and BMGC had high numbers of fish weighed.

Tournament	AvgOverall Blue Marlin Weight (lbs)	1st Avg Weight (lbs)	Avg 1st Payout	2nd Avg Weight (lbs)	Avg 2nd Payout	3rd Avg Weight (lbs)	Avg 3rd Payout	Avg Weight After 3rd place	Avg Payout after 3rd Place
Emerald Coast Blue Marlin Classic	624.3	699.8	273,626	645.9	176,205	600.1	106,901	427.4	40,80
Cajun Canyons Billfish Classic	524.9	595.2	67,725	572.4	50,463	447.2	47,016	389.5	34,29
Mississippi Gulf Coast Billfish Classic	500.7	634.4	220,262	581.8	100,667	503.7	113,613	409.8	27,59
Orange Beach Billfish Classic	462.9	504.4	101,668	436.9	80,990	359.8	29,870		
Blue Marlin Grand Championship	532.0	693.2	314,785	584.4	142,019	518.4	78,757	460.6	15,52
Gulf Coast Triple Crown	529.0	625.4	195,613	564.3	110,069	485.8	75,231	421.8	23,64
Percent Payout Decline					44%		32%		68%

Table 1: Table of Average Blue Marlin weight & Payout for 1st, 2nd, 3rd, and after for each Tournament & averaged for the Gulf Coast Triple Crown

Table 1 includes all fish for the past five years and shows the average weight of a 1st, 2nd, 3rd, and after (every Blue Marlin weighed after third place) Blue Marlin in each tournament, the average payout for 1st, 2nd, and 3rd, as well as the average payout for any Blue Marlin that won money but didn't place in the top three in weight. The numbers from each of the tournaments were averaged to give the average weights and payouts for a Blue Marlin in the Gulf Coast Triple Crown Series for 1st, 2nd, and 3rd. Table 1 shows that the average of all Blue Marlin killed in the Gulf Coast Triple Crown Tournament Series over the past five years was roughly 530 pounds. The highest average was seen in the Emerald Coast Blue Marlin Classic at an average of 624.3 pounds. The lowest average was in the Orange Beach Billfish Classic at 462.9 pounds. The highest average for 1st place was seen at the Blue Marlin Grand championship with this tournament having an average 1st place fish of 693.2 pounds. The lowest average for 1st place was seen at the Orange Beach Billfish Classic. Three of the five tournaments had an average weight of a 3rd place fish above 500 pounds. The two exceptions being the Cajun Canyons Billfish Classic and the Orange Beach Billfish Classic. For the Orange Beach Billfish Classic, there was only one year where a 3rd place fish was weighed so the average for the weight and the payout are the result of that one

Blue Marlin. Additionally, there is no average weight for after 3rd place and the payout is zero for the Orange Beach Billfish Classic because there have been no fish weighed in the past 5 years of the tournament that did not place in the top three.

The lowest average payouts were seen in the Cajun Canyons Billfish Classic. The average weight of a killed Blue Marlin at the Mississippi Gulf Coast Billfish Classic is 500.65 pounds which is less than the average weight of a Blue Marlin for 1st, 2nd, and 3rd place at the tournament. This is the only tournament where this is the case. Finally, the table shows relative decline in the payouts from 1st, 2nd, & 3rd place. However, the averages for the payouts after 3rd place are significantly less than the others; almost as if the bottom drops out in the amount won for a payout after 3rd place.

The table of averages maybe the most telling figure in the set. Upon first glance, the average size of a blue marlin killed in the Gulf Coast Triple Crown Series is a 529-pound Blue Marlin, which could suggest that the size limit is in a good place because that is a good size average fish. However, this number being 529 pounds is more a product of a good fishery with big fish than a size limit. If the size limit were raised or lowered for that matter, a 650-900+ pound fish will never be in jeopardy of not being weighed because it is such a big fish. Thus, if you have big fish being weighed like the Gulf does, then it will pull that number up regardless of size limit. The number is a good average and its saying the fishery is in a good place but it is not something the size limit should be based off of. ECBC also has the highest average payout of a fish after third place. However, this number is a product of two numbers (two fish) a fish that netted \$11,610 dollars and a fish that netted \$70,000 dollars, which was somewhat of an outlier. Also, the average weight after third place in the MGCBC is much lower than the averages for 1st, 2nd, and 3rd at 409.8 pounds, suggesting there are some very small fish being weighed. Additionally, the average payout for after third place in MGCBC is \$27,593 dollars. This number is despite a 4th place 416.2-pound Blue Marlin that earned \$232,875 dollars. This fish had a major impact on that average, yet the average was still low. The fact that this average is still low is saying that these smaller fish in this tournament are being weighed and earning little or no money; essentially being wasted. Data is suggesting in this tournament that to really earn money in this tournament, one needs a bigger fish.

Most importantly, if we look at the data as a whole the average of the Gulf Coast Triple Crown Tournament Series, a team on average needs a 500-pound Blue Marlin to place 1st, 2nd,

and 3rd in a tournament. The average for 3rd place overall is a 485.8-pound Blue Marlin. This number is swayed by the only time over the past five years in the Orange Beach Billfish Classic Tournament a Blue Marlin placed third in the tournament and it happened to weigh 359.8 pounds. One fish is really dropping the overall average and is an outlier, the average weight for 3rd without the outlier is 517.4 pounds. The average payout after third place is \$23,643 dollars but as we discussed earlier in this paragraph, that small number (a fraction of the size of 1st, 2nd, 3rd payouts) is really influenced by three or four Blue Marlin over the past 5 years. Thus, the majority of these small Blue Marlin being weighed after third place win little to no money and are a waste. Additionally, the average payout of after 3rd place (\$23,643) declines 68% from the average payout from a Blue Marlin that places third. That is the largest percent decline in a payout. When coupled with the fact that the average overall payout after 3rd place is truly influenced by the large winnings of a couple of fish rather than as a whole, it makes a couple points. First, the percent decline would be even greater if it weren't for those few fish; not discounting the fish, but the outcome of the size limit should not be determined by three fish in five years. Secondly, it pushes back against the argument to kill a small fish and maybe get lucky in the Calcutta because on average that Blue Marlin is going to make 68% less than a 3rd place fish and in reality, that's helped by those few fish. Thus, the odds of making good money from killing a non-placing small fish are small at best. Finally, when the decrease in a payout for after 3rd place more than doubles the decrease from 2nd to 3rd place, is it truly beneficial to keep allowing fish that will consistently end up in this category to be killed?

Length (in)	Corresponding Weight (LBS)
101	338
107	408.7
110	447.5
115	517.6
120	595

Table 2: Basic Atlantic Blue Marlin Length to Weight Conversions⁴

This figure is a table using length (inches) and through conversions, the corresponding weight of that length. This is an estimate table for Atlantic Blue Marlin. The converter is a converter based on research and data collected from sampling 3260 female Blue Marlin from the Gulf of Mexico, Caribbean, and Northwest Atlantic. From this sampling, a converter was created to give estimates on weight to length. The R-squared value from this data was .92. I chose a few different lengths, 101 inches, 107 inches (highest length of any Gulf Coast Triple Crown Tournament), 110, 115, and 120 inches in order to see the size distribution. Additionally, the breeding column comes from research done by the International Commission for the Conservation of Atlantic Tunas (ICCAT) that talks about female breeding maturity and is the calculations ICCAT uses today⁵.

Interview Results & Additional Interview Themes:

Betting & Calcutta's Role in Killing Fish:

Interviewees consistently noted that betting in general is a huge part of these tournaments and that betting in the Calcutta levels plays a big role in these tournaments. Boats who often bet heavily into the Calcutta divisions have (or make the argument that they have) incentive to kill a fish because they have the potential to win a decent amount of prize money even if the fish is small or does not place 1st, 2nd or 3rd because they are gambling on the fact that the boat that does win did not bet at all or as heavily in the Calcutta as they did. In talking to a fisherman who has fished the Gulf Coast Triple Crown Tournament Series at a high level as well as talking to a former employee of the Billfish Foundation who was on the board for one of these tournaments and fishes them consistently, this topic was discussed. Both of them talked about how a significant issue is that there are too many divisions of Calcutta bets for killed Blue Marlin in the

Gulf Coast Triple Crown Tournaments. This is important because these numerous divisions create these high buy-in, high payout Calcutta levels. Both of the interviewees made the point that only about 10 to 12 boats (teams) can afford to buy-in to these high-end Calcutta divisions, and they are going against each other for the high payout from this division. Thus, their odds of getting paid are 1 in 12 as opposed to 1 in 80 (assuming an 80-boat tournament). Due to this, their incentive to kill a Blue Marlin is very high. The incentive is still high even if the Blue Marlin is small and the boat (team) knows the Blue Marlin will not place in the tournament because the team can still achieve a decent payout if they are in this high Calcutta division because they are only going against roughly 12 teams.

Therefore, these Calcutta bets (especially the high-end divisions) play a big role in why smaller Blue Marlin are weighed at tournaments. Due to its role, potentially changing the Calcutta divisions could help prevent waste in addition to adjusting size limits. In fact, both interviewees suggested that tournaments should reduce the number of Calcutta divisions in the tournaments. They stated this would not reduce overall payout, money generated, or tournament participation, it would just give more money to a few winners rather than smaller payouts to more people. They believe this would reduce the incentive to kill some of the smaller fish that teams know will not win first place. In fact, one of the tournaments is already doing something of this nature (discussed below). However, in an interview with a tournament director, they said that the tournament takes 10% of the money off of every Calcutta division. So, by reducing the number of Calcutta divisions the director believed it could negatively impact the tournament. They stated that it costs a lot of money to put the tournament on so the revenue is very important. They believed by using the right size limit, the incentive to kill smaller Marlin could be combatted without losing the money.

Determining the Size Limit: Challenges

In conducting interviews, the interviewees described multiple challenges in determining the size limit. The interviewees discussed the challenges posed by length variability to corresponding weight, deck checking, and the challenge of whether to use just length or weight as the size limit metric.

Length Variability: One of the challenges interviewees described in determining a size limit is whether or not the size limit should be set by length or by weight. The tournaments in the

Gulf Coast Triple Crown Series all use a minimum length size limit in their tournaments, meaning a Blue Marlin has to reach a certain length (inches) in order to for it to qualify to be killed in the tournament. Length can be a tricky variable to set as a limit because there is so much variability around length of a Blue Marlin and how it corresponds to the weight of a Blue Marlin. In particular, there is a lot of variability around length as it corresponds to weight for Blue Marlin in the Gulf of Mexico. Interviewees suggested that Blue Marlin in the Gulf of Mexico generally tend to be fatter shorter fish due to the food (tunas, dolphinfish, hardtails) that gather around the oil rigs in the Gulf of Mexico, effectively holding the bait year-round and allowing the marlin to continue feeding without having to search as much.

This point was reiterated in an interview with a worker from the Billfish Foundation who collected and analyzed tagged blue marlin data including weights, lengths, releases, and reports from the Gulf of Mexico. During the interview, they talked about how all the data from the Gulf of Mexico on Blue Marlin points to the fact that they are shorter and fatter than other Blue Marlin. They said there is just so much food around the oil rigs in the Gulf of Mexico that the Blue Marlin get on a “Buffet Line” and never get off. This was discussed about how this makes it hard to pick a size limit, especially with length because you want to make a size limit that eliminates small wasted marlin. However, you don’t want to cut a boat that catches maybe a 107-inch marlin that weighs 550 pounds (for example). There is so much variability around that 106 to 107-inch size limit, which is proven by the data collected from the tournaments. For example, in 2017, the Double J weighed a Blue Marlin in the MGCBC at 107.5 inches and 553.43 pounds. Oppositely, the boat Tico Time weighed a Blue Marlin in 2014 for the Orange Beach Billfish Classic at 108 inches and 360.8 pounds. These two fish are essentially the same size at 108 inches with one being 550 pounds and one being 360 pounds, a 190-pound difference for a fish the same length. Thus, there is a lot of variability of how length corresponds to size, making it a challenge to determine an accurate size limit that helps all parties. A size limit of just length can still allow these smaller fish to get weighed in these tournaments making not necessarily the best biological size limit.

Deck Checking: Another issue that poses a challenge when using length as a size limit variable is the practice of deck checking. During an interview with a fisherman who consistently fishes the Gulf Coast Triple Crown Tournaments, they brought up the issue of “deck-checking” a Blue Marlin in these tournaments. “Deck checking” is when a team kills and brings a Blue

Marlin that is close to the size limit (in length) aboard the boat and measures the fish with a tape measure. If the Blue Marlin reaches the size limit then the team will keep it and if it does not measure then the team will throw the fish back in the water and count it as a release, despite the fact that the fish is dead. This is against the rules but it is almost impossible to enforce short of a video showing deck checking. The interviewee stated that as long as a tournament has a size limit based on length, then there will always be deck checking and the fish that don't reach the necessary length will be thrown back dead and wasted. So, even if the length was raised to 110 inches as the size limit, anglers and teams will deck check the fish if it is close. Also, it is much easier to tell size by weight rather than length especially when it comes down to inches in length. If one has a 400-pound energetic Blue Marlin on the line, it's going to be very hard to determine the length while keeping it alive. Due to this challenge, potentially having a weight only size limit is better to use than length. However, in talking to a tournament director, one of the strategies they employ to prevent deck checking is in through video. For a fish to count as a released fish, the tournament has to see a CONTINUOUS video of the deckhand grabbing the leader (once leader is grabbed by deckhand, a fish is considered caught by International Gamefish Association Rules) and the fish swimming away whether the hook was taken out or the fish broke at the leader. If the video goes out at any time during this process than the fish cannot count as a released fish. Thus, it prevents a team from videoing a leader touch and then cutting a video while they deck check a fish to either kill it or count it as a release (even though the fish is dead).

Weight rather than Length as a Measurement: Due to all of the variability around described by these interviewees, it is possible that using weight rather length makes more sense as a metric of the size limit. In a different interview with a person who is prominent figure in the tournament scene and has talked about this point of deck checking and length versus weight size minimums in articles, this topic of why a tournament would use length as a size limit was discussed. They said because length is the only exact science to get an exact measurement. They made the point that yes, it is very easy for most of these fishermen (professional fishermen) to tell the weight of the fish beside the boat, but expressed doubt that the average fishermen can distinguish a 450 pound from a 500-pound Blue Marlin. Many professional fishermen fish these tournaments. There are also just average fishermen who fish these tournaments that have boats, don't always fish for Marlin, and see the large potential payout, and decide to enter the

tournament to try to get lucky and win a bunch of money. These average fishermen are great for tournaments because they bring economic gain for the community, area, and marina (plus its overall just good for the sport to have casual fishermen). However, the interviewee made the point that these people cannot really identify the weight of a Blue Marlin but they can identify the length to an exact point. A technique used to measure length to an exact point is teams have a string tied to a pole on one end that is cut to the minimum size (whatever it may be), with a tennis ball on the end of a string, which allows them to measure a fish in the water. The interviewee suggested without length as a measurement, many non-qualifying Blue Marlin could be brought to the scale because these fishermen cannot truly tell the size of a fish just by looking at it (i.e. eyeballing and judging its weight). But they added that as long as length is there, the possibility of deck checking will exist.

Change in Culture:

Potential Social Change: A theme that came up during interviews a few times was about a change in the culture of the Blue Marlin Fishermen in the Gulf Coast. During one interview, for example, an interviewee described a social change in the Blue Marlin fishermen in the Gulf Coast where more and more fishermen are in favor of raising size limits and trying not kill smaller marlin in tournaments. The interviewee recounted talking to a fisherman who works (fishes) on a prominent tournament boat that plays into the high level Calcuttas. This fisherman told the interviewee that they (the fisherman) were tired of killing these smaller 300-pound level Blue Marlin on the off the chance the team will win a decent payday. The fisherman told the interviewee that they knew there was a decent chance to win money but they still were just tired of killing that small fish, despite the potential money, it was ‘...just not fun anymore’. This is a telling anecdote because it comes from a fisherman on a top boat that fishes all the tournaments, so it is someone who has been in the industry for a long time and is familiar with the tournaments. I have seen this same theme even just in conversations with other fishermen who fish these tournaments. I remember another fisherman similarly said, “Man I would be for just pushing that size limit up to 115 inches, so only these giants would be brought in”.

In an interview with a tournament director, I asked them if they had experienced or noticed that there has been a shift in the culture towards killing bigger fish and eliminating the waste of killing these smaller fish. The tournament director stated that they had seen this change in the culture. I asked the tournament director why he thought this change was occurring. They

responded by talking about this fishery at its core, although there is potential to win a lot of money, is about image. The interviewee stated that boats are not really fishing for money, but rather bragging rights. They added that money obviously plays a big factor, but most of the owners have so much money, that the money is secondary to the glory they get from weighing a big fish, also known as 'dock swag'. The interviewee stated that boats look at it nowadays that yes weighing a 105 incher is nice, but not as nice as a bringing in a 110 or 115 incher. Part of what affects this is the new technique of live-baiting to catch Blue Marlin.

This fishing technique has become a new and prominent technique of targeting Blue Marlin in the past seven or eight years. Due to this, more big fish are being weighed than before at these tournaments, so people see more bigger fish coming in and thus the dock swag of bringing in a smaller Marlin is lessened. An interviewee added another story from a couple years ago where a team at a tournament had weighed a very small Blue Marlin and when some the captains came to the next tournament they were bad mouthing that boat for killing such a small fish. These same ideas or themes were echoed in another interview with a fisherman of the Gulf Coast Triple Crown Tournaments and who is on the board for a tournament in the Gulf Coast and knows potentially every captain, owner, and boat in the Gulf Coast. This interviewee stated that in his talks with captains, owners, and mates that fish this tournament series, for the most part these people are in it for the bragging rights. They explained, obviously it is nice to get a check (a payout of money) but it is more important their check in the picture is bigger than the guy next to them, regardless of the money. Again, money is nice, but it is more important to hoist a bigger fish than everyone else.

Conservation Wave: Also during an interview, a tournament director also added that people in the industry, especially captains, are more conservation orientated, aware of issues, and are more apt to try and prevent issues from continuing. For example, the interviewee told a story of how last year they were on the water fishing and a person on the boat smoked a cigarette and threw the used cigarette butt in the water. The captain of the boat then proceeded to stop the boat and told the person to jump in the water and get the cigarette because the person smoking was not going to pollute the water. Another fisherman expanded on this conservation wave a little more. They said, fishermen are more and more behind the idea of changing the size limits and moving them higher because the fisherman want to protect what they have. The interviewee added that fishermen in the Gulf have seen what happens when they do not take care of a fishery

and deplete it such as with Red Snapper. Also, they have seen how its mismanaged (in their eyes) now and they do not want to go through that with this fishery, so they are more inclined to make sure to protect what they have. The interviewee finally added that everyone sees everything nowadays, and public image is a real thing to many people. Many of these owners own businesses and they do not want the perception of their fishing tournament being a bunch of dumb rednecks that kill every fish. Thus, clearly more conservation minded people are in the industry and it makes sense that they would have conservation minded beliefs in regard to size limits which is why we see some of the culture shift.

The Origin & Tournament Common ground: In multiple interviews with fishermen and a tournament director the point was made that about three years ago Costa Del Mar and the Billfish Foundation came to the directors of some of the tournaments in the Gulf Coast Triple Crown Tournament Series and talked to them about having the tournaments raise their size limits. These organizations sponsor and give a lot of money to these tournaments and are all about conservation so they came to them try to encourage the tournaments to raise the size limits. As a result a few tournaments raising their size limits to 106 inches initially, and since then the other tournaments that originally didn't raise their size limits have raised their size limits to 106 inches, with one tournament raising theirs to 107 inches. So not only are some of the fishermen experiencing a social change but these stakeholders (companies) such as sponsors are influencing the tournaments as well, and are influencing it in a more conservation minded direction. According to a tournament director, this process (or influence) brought the tournaments together. Essentially, rather than competing against the each other, the tournaments are working together on trying to have the same rules and size minimums in all the tournaments according to the tournament director. This is very beneficial because when change does happen, it will not disproportionately benefit or hurt a tournament making it more likely to be effective and be accepted.

Looking at all the sub themes from this discussion, there seems to be a culture change around the killing of smaller Blue Marlin, fishermen are more apt to kill bigger Marlin nowadays because of the superior dock swag and bragging rights it provides. Also, according to interviews, there is just a change in the people that surround the industry that they are more conservation minded. Additionally, the sponsors and stakeholders in this fishing scene have proven to be more

conservation minded and are willing to take the ideas to the tournaments to bring about change. Thus, all of this comes into play when changing a size limit.

The Ideal Size Limit

As part of the interviews, respondents were directly asked what they thought the size limit should be, given social, economic and biological considerations, and how they thought any change would affect the tournaments. One of the fishermen in an interview stated they would want to have a size limit at 110 inches and 500 pounds; meaning the fish has to be at least 110 inches as well as weighing a minimum of 500 pounds to be killed in a tournament. A different interviewee stated they would also want a 110 inch and 500-pound minimum size limit. Talking to one tournament director, they said that they would want a size limit at 110 inches and they also stated that they would be in favor of moving up to an even higher size limit in the near future at around 115 inches. They emphasized they would like to get where only two or three Blue Marlin were brought to the scale each tournament. Talking to another tournament director, they stated that they would want to have size limit at 111 inches. In talking with one tournament director, they said they would want to keep their size limit at 106 inches because they believe that translates to roughly a 500-pound Blue Marlin and increasing it would discourage participation in their particular tournament. Differently, another fisherman stated they would be in favor of having a very large size limit of around 120 or even 125 inches so only massive fish were brought in. A final fisherman and a board member of a tournament on the Gulf Coast said they would like the size limit to be around 110 inches to 112 inches to start with the potential to move up in future years.

One of the interviewees who stated they would like to see a size limit at 110 inches and 500 pounds believed that increasing the size limit would have no negative effects in terms of tournament participation as long as the size limit was standardized across all of the tournaments. In doing this, no one tournament would be unjustly impacted because all the tournaments would be the same so the incentive to fish them would be the same as it is now. The tournament director who wanted to increase the size limit to 110 inches and potentially higher up to 115 inches in the future, also stated that they thought there would be no negative impact on the tournaments if the size limit were to be increased. This interviewee discussed that moving up to 110 inches would not keep people from fishing these tournaments at all, it would rather just make them pickier about killing a fish. For instance, if a boat has a borderline fish next to the

boat early on the tournament rather than hoping to get really lucky and killing the fish, they would release it and try for a bigger fish for the rest of the tournament (or try to release more fish for catch and release points). The interviewee added, boats kill fish right now because the rules say they can but bumping it up would not anger people, it would just result in less Blue Marlin being killed.

One tournament director wanted the size limit to stay at 106 inches because they believed it to translate to a 500-pound marlin. Due to the variability around length discussed earlier, 106 inches does not necessarily translate into a 500-pound Blue Marlin. However, the tournament director's goal is to be around a 500-pound minimum size limit, so in reality their ideal size limit is not so much different than the other interviewees. Again, it seemed for this particular tournament going out in a limb might be bad but if the size limit is standardized across all of the tournaments, it should combat this. The fisherman who talked about bumping up the size limit to 120 or even 125 inches and putting more money back into catch and release divisions, believed that if the rules were same across all tournaments then there would be no negative impact on the tournaments. They also stated, the rules are the rules and people would just have to follow the rules and if it did cause some people to leave then it would most likely be the smaller end boats that don't really give much to the tournament anyway. They finally added, if the money is there people will stay, no matter what division the money is in or the rules are on size limits. The final fisherman and board member of a tournament who suggested having a size limit at around 110 to 112 inches thought that increasing the size limit to this minimum would not affect the tournaments in any negative capacity. When pressed, he said there could be a potential slight decline in participation the first year if anything, but if it did, he firmly added it would be back up the following year. The interviewee stated moving to this size limit is pretty simple because the fishery is good enough that the winning fish are just as big or bigger than this size limit already. Thus, they said there really should be no impact it would just help keep 10 Blue Marlin from coming to the tournament where only a few win money.

Interviewees were open to the idea (if not in favor of) adjusting the size limits in these tournaments, though there was some variance around which size limit they believe would be most effective. However, all the interviewees made the point that they believed as long as the size limit was standardized (made the same) across all the tournaments in the Gulf Coast Triple Crown, then there would be no significant negative impact. One tournament director said that a

tournament makes most of its money from sponsors. Thus, if sponsors are pushing for more conservation minded things (as seen) it should be taken in to account and tournaments should consider using a more conservation minded size limit.

CONCLUSION:

Changing Size Limits: I would recommend the Gulf Coast Triple Crown Tournament Series should change the size limit for a minimum killed Blue Marlin across all their tournaments. A higher size limit change would help reduce waste (biological standpoint) while still being beneficial from economic and social standpoint. Every tournament shows a positive relationship between weight and money earned, meaning that, for most part, the heavier a fish is in these tournaments, then the more money it will win. Killing a small fish will more often than not result in a team winning little or no money. Additionally, the data show that to place (1st, 2nd, or 3rd) in one of these tournaments a Blue Marlin really needs to be above 500 pounds, on average, in one of these tournaments. Thus, why would a tournament use a size limit with the potential for a 380-pound Blue Marlin to be killed if that size fish for the most part is not going to place or even win any Calcutta money? Furthermore, the payouts for a weighed Blue Marlin after 3rd place are at a 68% decline from payouts for a 3rd place Blue Marlin, the largest drop off (i.e. from 1st to 2nd & 2nd to 3rd), plus, those numbers are inflated by two or three smaller fish that won a lot of money.

From multiple interviews from a social aspect, it seems that fishermen and people around the industry are in favor of raising the size limit. This is really telling because these are the people that are in the industry and have to live with the decision. It is also suggested that if the size limit were standardized across all the tournaments (and is not increased to some radically large amount), then it would have no impact on tournament participation and therefore no negative economic impact on the tournaments. Thus, from a social standpoint, it would be appreciated. Plus, the size limit allows for some variation so it is not a radical change, just an effective one. Finally, by raising the size limit this would bring fewer smaller breeding female marlin to the scales and would allow them to continue growing and spawning for future generations of Blue Marlin.

Considering all the challenges for setting a specific size limit makes it hard to find one that helps all parties. However, I suggest using a combination such as 110 inches or 500 pounds as a size limit would be beneficial. That way, a weight limit of 500 pounds would allow for the fatter fish in the Gulf that don't reach the minimum length but are potential tournament winners could be kept in, but the 110 inches would keep the lower end of Blue Marlin that cannot win

tournaments that would be let in with a smaller length size limit (such as a 107-inch fish that is 380 pounds) from being killed and wasted. Therefore, the size limit I would recommend to Gulf Coast Triple Crown Tournament Series is a size limit of 110 inches OR 500 pounds. This would mean that if a Blue Marlin was 110 inches in length is would be eligible to be killed regardless of weight, so for example it could be 480 pounds and 110 inches long. However, if a Blue Marlin would for example be guessed to be 500 pounds or more it would also be eligible to be killed, for example it could be 107.5 inches and 533 pounds. In theory, this technique could create incorrect guesses on weight; especially for inexperienced fishermen, but the length component would allow inexperienced fishermen to determine if a fish is eligible to be killed if they are unsure on weight.

In conclusion, the Gulf Coast Triple Crown Tournaments are wonderful and as long as they work together they can continue to accomplish great things as a whole and a community.

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