For more than 20 years we've been fortunate to be able to sample and study the fish brought to the weigh stations at the Mid-Atlantic $500,000. Very few billfish are landed on the east coast of the United States and this tournament affords us a unique opportunity to encounter a lot of specimens over the course of five days. As in previous years, we have produced a newsletter to share our results and to summarize the tournament's catch statistics. In our lab at the Virginia Institute of Marine Science we are currently investigating the population structure of several fishes including white marlin, roundscale spearfish, bluefin tuna, spotted seatrout, and tautog (blackfish), and we are investigating post-release survival of bluefin tuna.

If you would like to know more about our research, domestic or international management of billfish, or graduate education in marine science, please drop by to talk. I'll be down at the Canyon Club weigh station in the early evenings and under the tent after that. My colleague Dr. Jan McDowell will be at the Ocean City weigh station. We'd love to meet you.

Tight lines,

John Graves
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Drs. Jan McDowell and John Graves

No "Hero" Shots, Please!

Imagine sprinting hard for five minutes and then having someone hold your head under water – doesn't sound good, does it? Well, that scenario may be more or less what an energetic white marlin experiences after a few minutes fight and being removed from the water for a photo. In the early 2000s we used pop-up satellite archival tags to study survival of released white marlin and found a very low rate of post-release mortality (less than 2%) for fish caught on circle hooks. But recently, VIMS graduate student Lela Schlenker demonstrated much higher rates of post-release mortality rates for white marlin caught on circle hooks and removed from the water for just a few minutes.

Lela's thesis research was focused on the role of physiological stress in post-release mortality of white marlin, and her hypothesis was that fish with longer fight times would exhibit greater physiological stress and post-release mortality. To test this hypothesis, Lela took blood samples and attached pop-up satellite tags programmed to release after 30 days to white marlin equally distributed across three fight time categories: short (<10 min), medium (10 – 20 min), and long (>20 min). What she found was that

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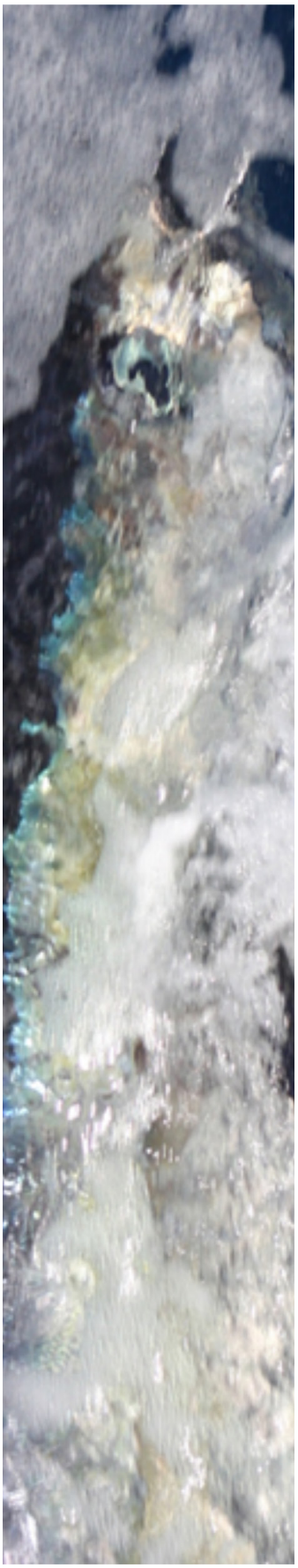

Winning Fish (

		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
White Marlin	**1st**	**86**	**69**	**69**	**69**	**77**	**89**	**74**	**78**	**68**	**69**
	2nd	83	68	65	68	69	76	71	67	61	63
	3rd	76	61	65	64	66	72	68	63	---	63
Blue Marlin	**1st**	**466**	**615**	**586**	**746**	**455**	**748**	**534**	**522**	**566**	**578**
	2nd	384	488	542	660	410	493	468	480	476	421
	3rd	359	435	522	519	407	448	412	464	---	---
Tuna	**1st**	**109**	**254**	**242**	**205**	**153**	**120**	**221**	**204**	**172**	**114**
	2nd	102	218	213	166	142	103	181	185	153	114
	3rd	95	200	139	108	126	99	105	185	141	112
Dolphin	**1st**	**36**	**42**	**53**	**33**	**34**	**33**	**33**	**43**	**39**	**29**
Wahoo	**1st**	**44**	**67**	**73**	**47**	**79**	**69**	**38**	**72**	**86**	**76**

Billfish R

White Marlin	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Boated	15	20	23	16	18	13	10	14	3	10
Released	84	136	174	177	153	124	231	432	58	220
% Released	85%	87%	88%	92%	89%	91%	96%	97%	95%	96%

Blue Marlin	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Boated	9	7	11	14	7	15	8	10	2	3
Released	3	8	13	16	11	26	17	29	32	10
% Released	25%	53%	54%	53%	61%	63%	68%	74%	94%	77%

Catch Per Unit

White Marlin	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
# Fish Caught	99	156	197	193	171	137	241	446	62	203
# Boats x # Days	393	408	426	417	435	381	393	411	399	378
CPUE (fish/boat-day)	0.25	0.38	0.46	0.46	0.39	0.34	0.61	1.09	0.15	0.61

Blue Marlin	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
# Fish Caught	12	15	24	30	18	41	25	39	34	13
# Boats x # Days	393	408	426	417	435	381	393	411	399	378
CPUE (fish/boat-day)	0.03	0.04	0.06	0.07	0.04	0.11	0.06	0.09	0.09	0.03
Marlin/Boat-Day	**0.28**	**0.42**	**0.52**	**0.53**	**0.43**	**0.45**	**0.67**	**1.18**	**0.24**	**0.64**

00 — Facts & Figures

weight in lbs.)

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
75	**91**	**75**	**75**	**88**	**92**	**92**	**95**	**88**	**82**	**79**	**84**
61	79	74	68	79	77	88	78	88	76	78	81
60	79	71	67	77	69	79	78	82	75	75	73
558	**433**	**518**	**699**	**722**	**536**	**719**	**453**	**---**	**565**	**416**	**441**
---	---	---	525	641	524	625	---	---	498	---	437
---	---	---	418	469	414	501	---	---	494	---	---
147	**82**	**182**	**193**	**184**	**212**	**80**	**69**	**177**	**148**	**233**	**243**
136	72	150	78	123	172	78	69	105	71	224	213
81	61	132	60	118	168	77	67	84	63	217	203
34	**43**	**44**	**47**	**44**	**39**	**43**	**37**	**56**	**53**	**43**	**77**
75	**95**	**58.5**	**74**	**93**	**77**	**74**	**97**	**49**	**50**	**42**	**38**

Releases

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
10	13	14	14	18	23	31	28	31	21	16	14
182	144	313	244	444	274	423	322	526	442	444	252
95%	92%	96%	95%	96%	92%	93%	92%	94%	95%	97%	95%

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
3	4	3	5	6	3	3	2	2	5	3	2
18	15	22	25	19	23	11	14	11	17	37	16
86%	79%	88%	84%	76%	88%	79%	88%	85%	77%	93%	89%

t Effort (CPUE)

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
192	157	327	258	462	297	454	350	557	463	460	266
393	384	429	507	528	462	423	408	402	287	354	351
0.49	0.41	0.76	0.51	0.87	0.64	1.07	0.86	1.39	1.61	1.30	0.76

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
21	19	25	31	25	26	14	16	13	22	40	18
393	384	429	507	528	462	423	408	402	287	354	351
0.05	0.05	0.06	0.06	0.05	0.06	0.03	0.04	0.03	0.08	0.11	0.05
0.54	**0.46**	**0.82**	**0.57**	**0.92**	**0.70**	**1.10**	**0.90**	**1.42**	**1.69**	**1.41**	**0.81**

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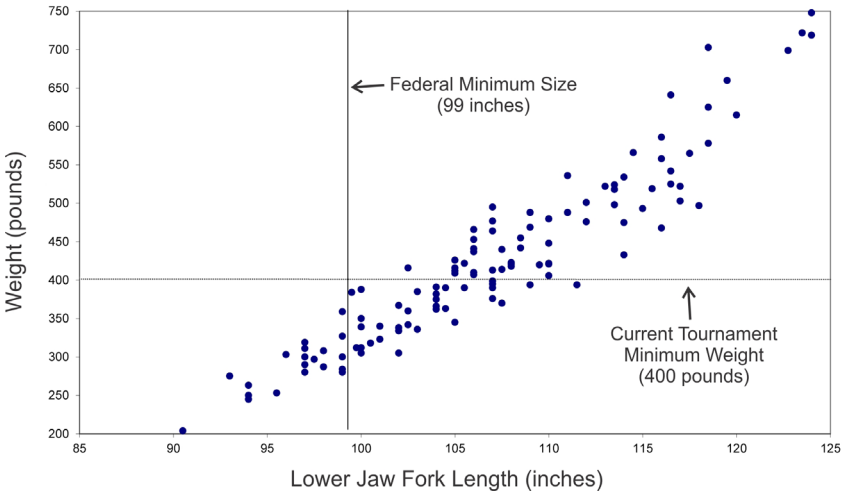
post-release mortality was not related to fight time – most of the mortalities occurred following fight times of less than ten minutes. The best predictor of mortality was an elevated level of potassium in the blood. In all, Lela noted four mortalties out of 19 reporting tags, resulting in a post-release mortality rate of 21%. That's more than an order of magnitude higher than we observed in our previous study! The difference between the two studies wasn't the fight times (the mean fight times were almost identical), the areas or seasons fished (we even fished with some of the same boats and captains), but the fact that Lela had to remove her fish from the water for approximately two minutes to get a blood sample.

Fish that fight very hard and put on a good show with lots of jumping, grey hounding, etc., even for short periods of time, can incur a significant oxygen debt. High levels of exertion can also cause cellular damage, resulting in elevated levels of potassium in the blood. Normally, a fish can recover from these physiological perturbations, "catching its breath" by swimming slowly as it respires in the water. However, if the fish is removed from the water, it may not have sufficient reserves to cope with the added stress and lack of available oxygen. This has been noted for recreationally caught bonefish, and appears to be an even bigger issue for billfish, which have relatively high metabolic rates. So, the take home message is simple: ***leave the fish in the water***. And as for photos, the real "hero shot" is the one taken with the fish in the water.

Blue Marlin Length-Weight Relationships (1992-2013)



There is a good relationship between length and weight for blue marlin. Fish need to be about 5 inches over the federal minimum size of 99 inches lower jaw fork length (LJFL) in order to meet the tournament minimum weight of 400 pounds. It's a different story for white marlin. The federal minimum size is 66 inches LJFL, but white marlin landed at the Mid-Atlantic $500,000 with a LJFL of 67 inches have weighed anywhere from 51 to 74 pounds! The best way to tell if a legal white marlin will make the tournament minimum weight is to see if it "carries the weight" all the way to the tail. *Long, thin fish won't make weight!*

White Marlin Length-Weight Relationships (1992-2013)