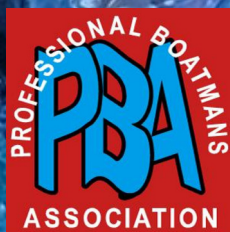


BLUEFIN TUNA TRAINING MODULE FISH WELFARE

PRODUCED BY THE UKBFTA
IN ASSOCIATION WITH THE ANGLING TRUST AND THE PBA



FISH WELFARE

WELFARE

The design of the CHART programs had fish welfare at their very heart. The results of three years of CHART, thousands of anglers involved in over 3,500 bluefin captures, gave us results that showed the success of those design and training aspects, delivering world class statistics in fish welfare.

We want to see those standards and outcomes maintained in the recreational fishery.

Understanding how and why we may get 'bad outcomes' for the fish is an important part of being a professional operator in this fishery.

In this article we will discuss these aspects, and how to mitigate them

Why do we care about fish welfare in our recreational fishery?

- Public opinion. Images of bloodied, dead or dying fish understandably play badly with the general public.
- Sustainability. Although our fishery is small in scale versus say the EU's commercial take, we should still aim to reduce mortalities to the bare feasible minimum.
- Effective use of Quota. Economically optimal model.
- It's the right thing to do!

We are going to look at the range of 'bad things' that can happen to bluefin as a result of the capture (and release) process. We will then show how those factors can be mitigated by us. Before that, an explanation of 'Incidental Mortality', ('IM') and 'Post Release Mortality', ('PRM').



Incidental Mortality

Incidental Mortality is basically fish dead boatside. They may come to the vessel expired already, or expire boatside, unable to be 'recovered' and released alive. IM must be accounted for in an ICCAT members quota.

That is why

- 1) Have to set aside quota to account for possible mortality.
- 2) Record and report fish length of mortalities which DEFRA/MMO convert to estimated weight to report to ICCAT each year.

If we exceed our quota allocated to such mortalities within the season, the fishery must close, unless unused quota can be transferred from another sector, e.g. targeted commercial or commercial bycatch.



Post Release Mortality

Post Release Mortality is fish that expire after release, within a time frame that indicates their mortality was likely associated with the capture process. Assessments of PRM rates in recreational catch and release fisheries can, and indeed has been assessed by the use of Pop-off Satellite tags, (PSAT's). Although it is possible to estimate PRM rates, there is no obligation to make an allowance in a members quota for such mortalities, only Incidental Mortalities.

However, we should strive to understand the TOTAL impact our fishery may have upon the fish we catch and release, and in assessing the sustainability and relative economic benefits of different sectors, DEFRA/MMO/CEFAS do consider incidental mortality and post release mortality rates when looking at the impact of our fishery.

BACK TO BASICS: GEAR AND TECHNIQUES

BACK TO BASICS

In designing CHART and trying to ensure the best possible welfare outcomes, we went back to basics and looked at what the main vectors of 'bad outcomes' for our target species were. Basically, 'why do bluefin die' in the capture process?

We found there were four main risks illustrated in research into bluefin incidental and post release mortality from around the globe.

- Predation. (During the fight/restraint or soon after release).
- Physiological disruption. (A complex process beyond 'lactic acid' that many cite).
- Suffocation. (Bluefin are ram ventilators, stop them swimming and they drown).
- Physical damage. (Lacerations and blunt trauma from fishing gear and vessel.)
- Although 'predation' did feature in a number of fisheries as a notable contributor to mortality, the effective absence of similar predators in UK waters meant we dismissed this as a risk factor in our analysis.

What has it got to do with us?

- Physiological disruption. Excessive fight times, lack of effective recovery.
- Suffocation. Primarily tail wrapping, hindering forward movement.
- Physical damage. Damage from and tackle, vessel and/or restraint tools.

What should we try to do about it?

We added a fourth 'objective' to the list minimising 'lost fish'. Fish 'lost' in the fight not only carry a risk of taking tackle with them that could impede their ability to swim or feed, but that it also precluded the opportunity to 'reoxygenate' those fish boatside. This is a key part of the welfare process.

So our four objectives became.

- **Reduce unnecessarily long fight times.**
- **Mitigate tail wrap risk.**
- **Reduce gear/boatside damage.**
- **Reduce numbers of 'lost fish'.**

How do we do that?

After a lot of discussion with experienced bluefin skippers, crew and anglers, we came down to four key elements of gear selection, and four key areas of skills/techniques that can really help achieve those objectives.

Gear

- **Rod/reel.** You MUST have adequate, appropriate gear. The right rod and reel reduces fight times, greater control of the fish and less fatigue reduces tail wrap risk physical damage against the boat, and numbers of lost fish. Alongside this choosing the right harness/pad if fighting stand-up is up there with the right rod/reel.
- **Mainline/leader.** Choose the right quality components. The right lines aid in your efficiency and allow you to really pressure the fish, this again reduces fight times, allows control of the fish to mitigate hull damage and breakoffs.
- **Connections.** Choose the right connections in your set-up. Quality, appropriate crimps, swivels, snaps, shackles etc will mitigate break-offs.
- **Restraint tools.** Choose purpose designed lip-hooks or boga grips. The right tools (NOT conventional gaffs) will mitigate physical damage and fish lost boatside.

There is clearly more to it than just than gear and techniques, but if you make just those four key gear selection decisions correctly and master those four areas of key skills/techniques, you will have a huge impact upon fish welfare, (and angler safety too, in many cases).

Techniques

- **Fighting.** Understand and learn 'good fighting technique' Mastering this will reduce fight times and tail wrap risk, as well as physical damage boatside and the number of break-offs.
- **Boat Handling.** Understand how good use of the boat contributes to the outcome. A good skipper on the helm is a huge part of the package to effectively fight bluefin, it can reduce fight times, reduce tail wrap risk, mitigate damage boatside and cut the numbers of lost fish.
- **Leadering/Restraint.** Understand the right, safe way to leader and restrain fish. Getting this right will reduce fish damage and break-offs boatside.
- **Recovery and release.** Understand the best way to recover and release fish. The right techniques will mitigate physical damage boatside.

WHAT GOOD WELFARE LOOKS LIKE

WHAT DOES GOOD FISH WELFARE LOOK LIKE?

There are a number of metrics that illustrate what 'good fish welfare' looks like. Rather than expand this article further, we have covered them separately in another article, 'What makes a good bluefin fisherman', available on the website.

IN CONCLUSION

We should all want to ensure the best possible welfare outcomes for our quarry within a fishery that provides access for thousands of anglers in a licensed, managed way, and generates significant scientific and socio-economic benefits.

We CAN do that by obtaining the right gear, learning the correct skills, and put them to use every day on the water. We have an opportunity to set a new benchmark not only in terms of how prolific and valuable our fishery is, but in mitigating poor welfare practices and outcomes.

Let's make the most of that opportunity.



Physiological disruption, or 'stress' in bluefin tuna.

Bluefin are a miracle of natural engineering.

- They can control their internal body temperature allowing them to range from the Mediterranean and Caribbean, to the far North Atlantic, and dive down to 1000m+ in depth.
- They do this via a network of intertwined vessels that can transfer heat, (and oxygen) across their cells.
- They extract huge volumes of oxygen from the water via super efficient gills and pump it around their huge body with a big heart that can operate at greater depths and colder than pretty much any other fish on the planet.
- They are an incredibly robust fish that we know can survive being fought for extensive periods, dragged onto vessels via lip hooks, have blood samples and fin clips taken and large satellite tags attached via two barbs in their muscles.

However, we also know that some fish will come to the vessel in a state of near death, and do not survive. The 'stress' (a misunderstood term) of the fight is a frequently used explanation. Talk of them 'boiling in their own blood', or 'drowning in lactic acid' are often heard but are incorrect, emotive misinformation. The reality is complex and yet simple at the same time.

Oxygen, the stuff of life....

In simple terms, the biggest driver of the physiological disruption bluefin experience after intense activity, is a lack of oxygen. It's a bit more complicated than that and involves the relationship between O₂ and substance called ATP.

When bluefin run at speed they close their mouths. That stops water (with all the O₂ in it) running across their gills. That intense muscle activity needs lots of O₂, and they quickly exhaust that which is in their bloodstream. They have O₂ reserves in all their red muscle, but that is depleted by the continued activity in an extended fight.

At that stage a process begins which includes the cellular structure beginning to fail, leaching a range of chemicals into their muscles and organs. Instant experts talk about 'lactic acid' killing bluefin. In reality, bluefin are one of the most efficient fish in the oceans at dissipating lactic acid in their system... It is about much more than lactic acid build-up.

This chemical imbalance is what creates 'tuna burn' and can damage muscles and organs to a point that the fish will expire.

The good news?

If oxygen can be forced into the system before this process goes too far, those processes can be halted and reversed. Towing fish gently post fight is the equivalent of putting an oxygen mask on the fish.

There are a range of studies that show that even fish that have been fought for 90 minutes or more can survive post release IF the appropriate reoxygenation protocols are followed, (we touch upon this in 'fish handling', which can be found on the UKBFTA website 'CRRF resources' page).

The key is to avoid unnecessarily long fights, (the majority of fish can be subdued in 45-50 minutes with the right gear and good technique), and most importantly, understand and execute the recovery process correctly and for the required time. **Do not cut it short to 'get fishing again'. These fish deserve better than that from us.**

FIGHT TIMES

Studies have shown a relationship between the length of time a bluefin is on the hook and the extent of Physiological disruption, (but NOT yet a direct link to mortality rates). Additionally, overly long fight times will contribute to angler fatigue, which in turn increases other risks such as break-offs, tail wrapping and fish damage boatside.

Some were surprised at the short fight times achieved in CHART, averaging c20-25 minutes. Widespread use of spreader bars, (that generate drag that tires the fish), but also the use of appropriate tackle and guidance in good techniques contributed to these numbers.

What should we expect in the recreational fishery? A wider range of techniques, and experience levels of participants should be expected to see an increase in average fight times.

However, experience from fish caught on single lures/ trolled deadbaits in CHART, and pre CHART bycatch, show that fight times for the typical bluefin caught in UK waters DO NOT have to be the multi-hour affairs that some anglers have posted on social media and seem to regard as some kind of 'badge of honour'. With right tackle and techniques, good communication and boat handling this can be avoided,

Each fish is different, and we have a wide range of expertise in the fishery, but we also did amongst skippers in the early years of CHART, and anglers, over the three years.

It is difficult to pin down what 'the right' fight times should be, but we think some frame of reference for what is possible, is worth putting out there.

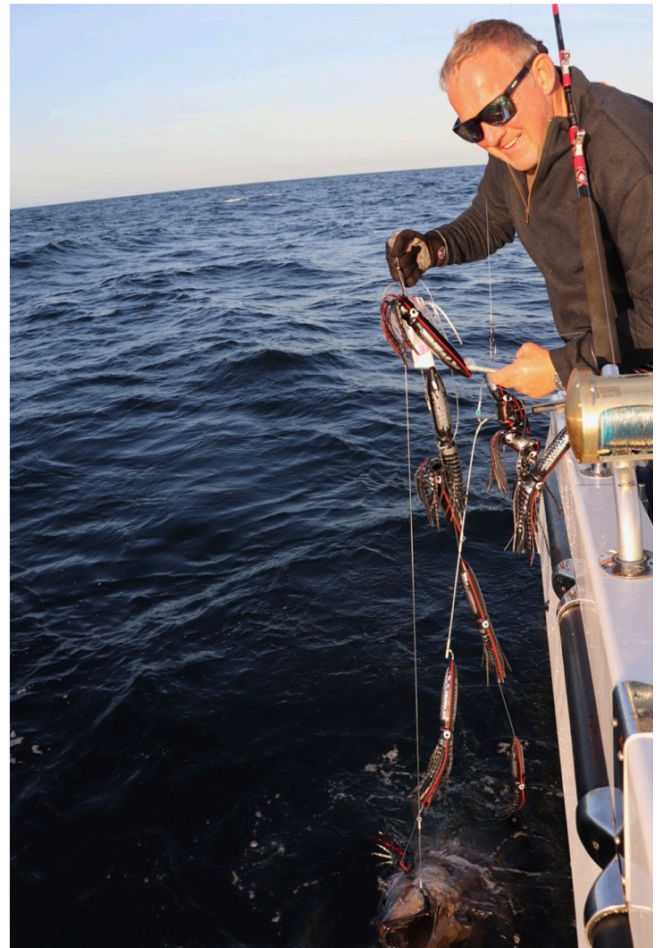
On adequate rods/reels, ('50-80' or '80 class' rods, 50W or 80W reels, the right stand-up harness/pad setup correctly, good angler technique and a good skipper on the helm).

We suggest you should be aiming for:

- Sub 200lb fish, less than 30 minutes.
- 200-350lb fish, less than 45 minutes
- 350-500lb fish, less than 60 minutes
- 500-600lb fish, less than 90 minutes.

These are a very rough, aspirational guide. They ARE achievable under most circumstances with the right gear and technique. The key point is that if you are consistently spending an hour on 200-250lb fish, or 90mins+ on 350-400lb fish, something needs to be addressed.

Fish fought from the chair or rodholder, should with the correct gear and technique, see times reduces from the above by 10-20% or more.



Produced by the UK Bluefin Tuna Association in partnership with The Angling Trust and the Professional Boatman's Association



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