

Jeffrey Ball's article, "Tuna Fight Muddies Waters Over Damage from BP Spill" (WSJ, January 13, 2011) provides a glimpse into the competing and inadequate science supporting international Atlantic bluefin tuna conservation and management efforts for over 40 years. This lack of scientific understanding of basic biological life history such as stock structure, migration and mixing patterns, age-at-sexual-maturity and spawning area data is deplorable.

Leading bluefin scientists question "from both scientific and management perspectives, the usefulness of the classic stock concept" for bluefin, emphasizing instead other approaches such as Clark's contingent and metapopulation theories. (see: Fromentin JM, Powers JE (2005) Atlantic bluefin tuna: population dynamics, ecology, fisheries and management. *Fish and Fisheries Journal* 6:281 -306).

Issues such as sexual maturity and the alleged "disappearance" of large assemblages of bluefin tuna are debated in and outside of the scientific community. The truth is, even with the substantial funding for bluefin research that has been available for decades, scientists will readily admit that they still understand little about bluefin tuna. Often, hastily-conducted studies that involve too little data taken from samples from too few locations become bluefin gospel, seemingly overnight. This eagerness to grasp data which has yet to ripen is symptomatic of the formidable challenge the bluefin presents to science.

The problem is that the bluefin do not fit the standard paradigm of the typical fin fish: highly predictable migratory movement annually from foraging grounds to natal origin to spawn, and then back to foraging grounds in an endless cycle. Bluefin, by contrast, will sometimes skip natal homing for a few seasons or more, will swim across the Atlantic and take up residence for months in very distant areas. And yet, the bluefin is a highly fecund marine species. The critical habitat of the highly-migratory Atlantic bluefin is nothing less than the entire pelagic ecosystem of the Atlantic ocean, an area so vast that many of these assemblages of bluefin are completely out of reach for fishing, tagging or population studies. Yet, with telemetric satellite tags, we can clearly see that they exist in these "distant patchy realms". The bluefin is a voracious forager, a unique, warm-blooded pelagic fish that never stops swimming to ventilate because it must generate heat to elevate and maintain muscle, eye, brain and visceral temperatures above water temperature. This endothermic attribute is highly unusual among marine species and significantly contributes to the bluefin's extensive capacity for migration.

Finally, Jeffrey Ball's reference to the bluefin as "one of the most majestic and prized creatures of the sea" is true but not because of the extraordinary price of \$396,000 paid earlier this month for one fish in Tokyo. This has no basis in US bluefin fishermen economics. This single annual event, a publicity stunt by an Asian restaurateur who owns restaurants in Hong Kong and Tokyo, has no relationship to normal bluefin pricing. US bluefin sells for an average of \$7-10,000 per fish and, after settlement costs and the enormous expense of air freight have been removed, the US fishermen receives an average of about \$7 per pound.

The fish that sold for \$396,000 was caught off the northern Japanese island of Hokkaido and weighed 754 pounds, a gross price of \$525 per pound. On the same day of that auction a bluefin sent to Tokyo from North Carolina returned about \$14 per pound to the fisherman, by US standards a very high price for a winter fish in relatively short supply due to winter weather and restrictive US fish size limits and closed coastal fishing grounds.

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