

**DEP/EPA HRI Committee Possible Guidelines for Habitat Enhancement
The Blackfish Sea Bass and Scup Artificial Reef Plan
Project Finfish – March 24, 2010, HRI Meeting
A Review of Florida Fish Enhancement Efforts From the 1970's
Commentary by Timothy C. Visel *
The Sound School**

Abstract

A review of the landing statistics and Connecticut fisheries history for these species and the lack of tautog (Blackfish) in general today cannot be fully described as overfishing. A review of the biomass and potential tautog spawning stock in the late 1980's should have "boomeranged" into succeeding decades. A more suitable explanation may prove to be we lost the habitat not the fishery. Looking at the 30 year fisheries history it appears as though several year classes of tautog failed to materialize as if they never existed. There was no reinforcement of the high biomass/spawning effort, from the high populations in the late 1980's. With such spikes in population the usual result is that provides strong recruitment levels for years to come. Because undersized fish were protected at the time by modest harvest size requirements, expectations would be therefore that a good or several significant year classes could then be expected to eventually enter the "fishery" during the next decade.

Upon review of the landing statistics it appears as though several year tautog classes disappeared as if they had suddenly vanished. Traditional fisheries management practices often do not work because they assume survival of juveniles is dependent upon a substantial adult spawning population. With habitat "failures" this approach is least effective as predation, and normal mortalities suppress an organism's ability to retake or regain lost ecological space. The problem is compounded if critical habitat is no longer functional and the species is largely non migratory. This can result in large local populations suddenly disappearing and combined with a long life span can make

* Tim Visel is a member of the Long Island Sound Study Habitat Restoration Committee. The view expressed here does not necessary reflect the DEP/EPA Long Island Sound Study. As of 2010 no consensus has been reached regarding the construction of low profile artificial reefs to enhance business opportunities at Connecticut's Bait and Tackle stores from the sale of reef only fishing permits. Nor has consensus been reached regarding the construction of high profile reefs to enhance recreational fishing.

restoration efforts extremely difficult for tautog. Migratory fish species are more resilient to localized habitat loss and simply avoid degraded habitats. They swim to new areas. A species like tautog that inhabits localized reefs and inshore waters stays close to its first settlement. It does not roam widely looking for cleaner or more suitable habitats. If its preferred habitat is lost, so is its ability to live. I contend that in the middle 1980's and early 1990's, Connecticut experienced significant habitat "failures" for tautog which reappeared as fishery "failures" years later as recreational anglers switched from winter flounder (which had also collapsed) to them. Overfishing then technically occurred because of recruitment failures. If this condition is carried out to its biological extent we call that "extinction." Connecticut had a somewhat moderated "extinction events" in the 1980s for tautog, one I feel was largely attributed to widespread habitat loss/degradation. Several areas had aquatic vegetation blooms, low oxygen and nitrogen enhanced algae eutropic events in the 1980s. The very shallow shell and sandy bottoms such as those in bays, coves, creeks and inlets provide cover for newly settled yet demersal tautog. But for several summers such areas suffered severe hypoxic events captured in field notes by a DEP intern at the time, Wayne Castonguay during 1987-1988. His comments made over two decades ago gives a snapshot of what then was happening in Connecticut and for that matter, tautog, during this period.

Keywords: Recreational fisheries enhancement techniques, habitat creation for the tautog or Blackfish, artificial reef management plan, habitat mitigation, the decline of the CT tautog fishery.

Introduction -

In the 1970's, the city of Hartford, CT was realigning and replacing a large segment of its sidewalks. A contractor who was conducting some of the demolition work for the project lived near my family home in Madison, CT; he was the owner of a summer cottage there and he soon saw the recycled utility of such one-foot thick 4-foot by 8-foot slabs of concrete to replace a deteriorating 1950's seawall on his property abutting a tidal salt marsh on Tom's Creek, Madison. His idea was instead of landfill use, he would build a slab seawall to retain soil from washing out from his property which it often did on easterly storm driven high tides in the winter. I watched as dump truck after dump truck load of sidewalk slab was dumped on his property. As the slabs landed, some tipped to create large cliffs and voids, and then it struck me, what great material to make an artificial fish reef for tautog, scup (porgy) and black sea bass. It was only a year after my first year of college at the Florida Institute of Technology, a two-year oceanographic

technical associate degree program. One of the projects at the time that caught my attention was a grouper artificial reef project. To me, those groupers looked a lot like blackfish back home in CT and few fish did.

So at FIT, I signed up for that fisheries seminar. Of interest to me is that the program was in fact, related to SCUBA divers. Large groupers, it seemed, hung near the bridge columns in the rivers and the Indian River, in particular which fronted our campus. Sport fishermen quickly confirmed the information to us. Bridge fishing was a popular recreational activity in the Sunshine State. Divers would often photograph large Groupers by bridges and the snapper/grouper fisheries they enhanced. Then unknown and more interesting to me were inshore proposals to place such structures just for grouper. Florida had long supported offshore artificial fish reefs, but these were to be close to shore so that recreational anglers could take advantage of them (the fishing activity). I learned that much of the success of Florida's public fishing piers was the pier itself- the pilings provided the habitat for the fish. My misperception was that piers allowed people the chance to cast towards the fish only, but as underwater films showed, the fish were there because the pier was there, a necessary structure to support entire ecosystems, the program ended with a phrase "fish for the fishers." What a wonderful program I thought. Why not Connecticut?

I asked some questions, one of which was about cost and got laughter from one of the speakers. Cost had nothing to do with it, fishing success did, three out of every ten tourist dollars spent in Florida was resource related, and much of that involved fishing and followed by something to the fact that bait and tackle shops back home did not have such a program. Again more chuckles, well certainly it would help them for sure, but the program emphasis was not to just improve their financial statements, but the restaurant owner, gas station areas, motels, food shops—it was to help everyone. Fishing it seemed, was big business in Florida and people would visit and pay to go fishing. This was a bit of a shock for the lone Nutmegger in this group. This was not my experience and couldn't imagine how much economic activity was generated by recreational fishing. I do now however.

Tautog and Reef Fish Communities, Madison, CT -

I was very fortunate to grow up with my family along the coast in Madison. Guilford and Clinton coasts also supported our modest lobster business which I ran with my brother Raymond. As such, we would frequently catch tautog and black sea bass in our wooden

lobster traps. More often than not, the blackfish had wreaked havoc on our trapped lobsters we planed to sell so we didn't mind adding them to the list of filleted fish customers that supplanted our lobster fishing. Tautog was a very tasty fish, firm flesh and a Native American favorite; after all, we still called it by its Indian name, *strong jaw*. And *strong jaw's* was a good name, and sharp teeth. Ray and I would groan when a lobster trap broke the surface and we heard slap, slap, of the tail; we knew we had lost some money. You didn't need to clean lobsters, but blackfish has a bone structure that made it hard to ignore. Blackfish like grouper liked bottom structure, rocks, where we would also lobster. At least once a week, we would haul a trap with blackfish hooks embedded in the float line. Blackfish scup, and sea bass liked the same habitat as lobster – structure. We had started lobstering in 1967, so had experienced several years of such catches of tautog only to find remnants of large lobsters in the trap.

But in the middle 1970's, having returned from Florida to take up studies at the University of Rhode Island, my southern artificial reef experience was still fresh. How many of these cement sidewalk slabs were available at the time, the response was about 5,000. Hartford was tearing up a couple of miles of sidewalk, some 8 feet wide, an estimated four to six thousand slabs were going to be chipped for land fill. He had recycled about 80 of them. The previous cottage owner in the 1940's had created a parking lot out of loose fill and sand over a salt marsh as was the practice back then. Boulders were added in the 1950's largely to keep cottage renters cars out of the marsh which I was told was an annual happening. However, the boulders did nothing to prevent erosion between them which was also an annual occurrence at winter high tides. After a few years of battling this problem, the recycled slabs were a way to prevent such wave scourging. For me, it was a chance to build a "Florida fish reef."

The proposal thirty-five years ago dealt mostly with enhancing blackfish, a species that we caught and sold to our seafood customers, but we also caught black sea bass and scup (porgy) in our traps as well. They tended to be smaller and not worth the effort so we usually threw these back overboard. However, structure attracted (housed) them as well and we were aware that each of these species had a loyal "fishing" clientele, so what helped tautog would also enhance those fisheries as well, not to mention lobster who no doubt also take advantage of this additional structure-enhanced habitat.

My call to a person at Connecticut's Coastal Area Management Program at the time as I described this project over the phone, and response was less than enthusiastic. Information was taken for examination of the material, but by now, weeks later, my

neighbor had largely finished with his project. At first, I had contacted John Baker, then Aquaculture Division Chief for the Department of Agriculture / Aquaculture Program. Mr. Baker's conversation was largely negative, his office didn't allow leasing for that type of Aquaculture and from his own experience; he doubted very much that such an effort to enlarge Kimberly Reef near Faulkner's Island with a series of six concrete slab reef piles would be approved by the DEP. Letters to DEP law enforcement were also not that encouraging.

Mr. Baker claimed that reefs were not aquaculture I countered with this exchange I could see little difference to putting down oyster shell to catch a set, to putting down slabs of concrete for young black fish. He paused, chuckled, and said, "You're right, not much difference. It might be 'extensive' but it's a type of aquaculture nonetheless." What was interesting was the longevity of the project, the lifespan of reefs could be measured not in decades, but hundreds of decades. That was an opportunity to harvest dozens of crops but took the acceptance of a long term resource project. I remember a story I read when young, regarding the English grand estates of the 18th century, the precursor of modern natural resource management practices. As the story goes, a grandfather took his grandson out to walk some of the acreage and carried a small bag of black walnuts. After the line of holes was dug and at least two nuts per hole carefully planted, the young boy asks when he will obtain some nuts. The grandfather smiles and says, "That's something your children will do, not me." Planting trees for harvest some 50 to 60 years later was common, in fisheries management few resource proposals were such long term.

Although it wasn't shellfish aquaculture, it was in my mind similar organized work to create more seafood. By the time the onsite inspection of the slabs was conducted, I was at the University to Rhode Island and the opportunity to use the slabs had long since passed. Mr. Baker was correct: the proposal was not well received. In fact, after the field inspection by DEP, it had been discovered that the work was conducted without a permit and that the slabs would now have to be picked up and repositioned to the 1940's property lot line. This would take most of my neighbors spring and summer weekends. The proposal to use the concrete slabs for a fish reef was flatly rejected however. The offer to have them delivered to Branford and transported was now off the table; also, as my neighbor's initial interest in the project quickly cooled with ongoing DEP involvement and potential legal issues and towards me for a while.

Mr. Baker predicted the response several months earlier and I inquired as to why the reply to him wasn't "natural" to have cement slabs in the middle of Long Island Sound. What

about all the breakwaters I set lobster pots around? They are different; before the state's new environmental policy and now would be considered as creating additional habitat for fish he doubted they would ever be approved.

I often wondered about more reefs for Connecticut. When lobstering, we would pass over what seemed to us limitless miles of flat featureless bottom, but a patch of glacier boulders would produce both lobsters and fishing for small boats anchored over them. To me, the life span of such an effort could be hundreds if not thousands of years. Any cost of the project should be considered to the long term economic benefit that could accrue from sport fishing similar to Florida's. After years of selling marine bait to several tackle shops, I knew that sport fishing was a big business. We would save big hermit crabs for them (they crawled into our lobster pots), but frequently would make "sales at sea" as some tautog fishermen had miscalculated the fishing which at certain times of the year, was very good here in Connecticut.

We used to fish a small reef just southwest of Tom's Rocks off Madison. The reef was small but two ledges formed a V-shaped hole, and it was 15 feet deep going to 8 at low tide. When the tide changed, we would fish the "hole". It was my father who showed us how to catch Blackfish, taking green crabs as bait, we would smash and chum the hermit crabs sending particles of shells, pieces of crab, any scrap fish and some conch slices into a rain of food particles around the hole. Then we would fish, it wasn't a challenge really, certainly we would lose some, they are so strong they would drag the lines across the rocks and break it. If we returned with fewer than a dozen large tautog it was a poor day. The concept of people traveling to Florida in 1973 to catch grouper, when we had our own type of grouper right here, and lots of them; looking back it was difficult to understand the difference.

Almost four decades has passed since my brief experience in artificial reefs. This time has not been kind to Connecticut's tautog fishery. Today, we have seasons, length restrictions and bag limits. Even with these restrictions fishing success is much smaller than it was in the 1980s. Connecticut has yet to enhance this type of extensive aquaculture but may soon. It seems that Roger Williams University obtained permission to experiment with Reef Balls™, a commercially produced artificial reef component designed to enhance fish habitat. Earlier projects used precast-septic galleries which resembled small pyramids; a stable base which anyway it landed would allow fish to aggregate around or in it. Although smaller than the concrete slabs, the concept is clear, a mechanical manmade device to enhance or create fish habitat.

Can we do here it and develop a Connecticut Artificial Fisheries Reef Development Plan?

I'm familiar with some of the more southern reef projects and acknowledge that their huge success has occasionally led to resource conflicts regarding harvest methods, by commercial or recreational user groups. I prefer to handle that by the gear type and limit such as hook and line only, whether it is for personal or resale use. Much of the state's population cannot or does not have access to fishing; several state programs encourage fishing, such as the very successful DEP CARE Program and they are excellent ways for more people to enjoy angling as a great recreational activity. There is also a large group of CT residents who like to consume fresh fish and can only get it at a local Connecticut market. Connecticut caught fresh fish is what people enjoy and they come to appreciate Connecticut's aquaculture and sea food production in local markets such as CT River Shad is sold each spring around the Connecticut River. In a 1979 – 1980 review conducted by Robert Sampson for the Connecticut DEP (Connecticut Marine Recreational Fisheries Survey) found that shore based man-made sites are most likely to be fished year round. In this discussion of angling sites (recreational) he states on page 36 "Boats and artificial structures appear to be more popular among anglers than natural sites" and one of the reasons being that man-made structures and boats is that they very simply "are more productive" man-made structures, particularly docks and jetties furnish natural cover currents and back water areas which tend to attract fish."

Seafood is a renewable natural resource, with some habitat creation and enhancement programs and proper studies, we could also produce more fish for the fisheries, just as other states have accomplished. I see such an artificial reef program having three direct and several associated benefits. First, if suitable materials are found, it may save landfill or disposal costs. At one time, New York was considering mixing concrete and ash to make a hard durable reef product. Tires were also used, but were not that successful; scrap steel and building debris was also considered but metal is largely recycled and mounded debris could enhance fish by providing structure however, the research I've seen this species prefers voids and holes, providing both "cover" and "refuge" functions. In the mid-1980's, even the concept of dropping granite slabs similar to those used in breakwater construction, but were considered, but was too expensive at the time. A suitable cheap material, preferable a recycled or unwanted material, would be a good place to start.

The economics also would be important; think of all the bait/tackle, ice, fuel, etc. would be involved. Several reefs down south are reserve/dive only, forming a refuge from all

fishing. People come and on clear days dive on them. Others are dive/spear only reefs and I am told that spear fishing for blackfish is a challenge and quite a sport; other reefs have a combination of commercial/recreational use. I could see the potential as these reefs would most definitely enhance our ailing lobster fishery with perhaps a winter lobster trap fishing over them when angling activity lessens. The overall project would help strengthen our economy and new areas for fishing and offers a different fisheries management approach. In a bulletin of the American Society – Florida Aquatic Habitat and Fishery Resources (1985 AFS Florida Chapter) edited by William Seaman Jr. Chapter 10 includes a section regarding such mitigation, restoration and creation of new habitats on page 408 William Seaman states “new habitat for a variety of fishes can also be created by placing artificial reefs in barren substate such as that prevalent along most of Florida’s west coast. All of the above methods (mitigation, restoration and creation) can be used to restore or create habitats that could improve the production of fishery resources in Florida” on page 475 artificial habitats are further defined as “any man made structure in which bio diversity/food webs have been established” larger structures that have been in place for many years have developed highly diverse communities. In the near shore area, bridges, such as those found in the Florida keys, have biota similar to be near shore patch reefs and live bottom communities submerged support structures are veneered with algal, sponge, coral, tunicate, and bryozoans growth. Spiny lobsters and stone crabs, find refuge in this habitat, and reef fish are common.” The time frame from placement until an artificial habitat becomes an effective fishery resource is dependent upon many variables. There is often a successional sequence of several years before larger invertebrates and fish are permanent residents of artificial habitats.”

Often fishing managers fail to address habitat enhancement believing one more of the below factors:

- Efforts will never be able to be measured quantitatively, often mentioned around hatchery efforts (how do we know it worked?)
- Habitat enhancement may not ultimately be successful
- Appropriations or authority to conduct projects are difficult to obtain as are the required resources and personnel.
- Provides potential opportunity for resource conflicts between user groups if successful
- Habitat creation, enhancement or mitigation may not meet with current regulatory approvals.

However, this is not universal. The shellfish aquaculture and salmon fisheries have shown success around hatchery and ocean ranching production. The hard shell clam fishery for example, included a genetic marker, decades ago, with a series of red striations in the shell which denotes it as hatchery produced. The State of Connecticut has over a century of releasing trout into streams, enhancing populations and fishing success. Trout Unlimited, a large volunteer organization has restored thousands of miles of trout habitats, a precursor to modern resource enhancement stewardship projects.

In 1974, I shared some of these comparisons to determine the rationale of restricting such reef projects here in Connecticut, remembering my Florida experience, which was rather detailed and quite extensive sport fish enhancement effort. The discussion here always revolved around the concept of using Long Island Sound as a “dump” for unwanted debris or that saltwater anglers had no mechanism to help defray the cost and that fresh water anglers assisted with hatchery stocking efforts paid also with a modest recreational license fee.

The contrast I felt was the presence of manmade reefs, as miles of granite breakwaters built for enhancing navigation and promoting harbor development a century ago. Although I watched recreational fishermen catch fish off Meigs Point for years and wondered if it created new habitat or just attracted fish from nearby areas, it still was a question, one that should be the subject of focused applied research.

In 1986 the blackfishing in Connecticut was excellent, and I did well fishing at my high school ledges I fished since the 1960's. For the first time numerous small fish were present and I released more fish than I retained. The fishery seemed to be healthy and the last time before selling my small Brockway skiff, I had a big blackfishing day. The thought of making more reefs for tautog was now a distance memory.

Twenty five years later, our blackfish populations are at very low levels, we have seasons, length limits and bag limits. How, within two decades, could fishermen be subjected to such a decline? To answer this question, the life history of this reef fish might provide the clue.

Young blackfish inhabit shallow tidal areas such as creeks and coves and often seek shelter in SAV – Submerged Aquatic Vegetation growing on or near shell bottoms. They are quite easily caught in handheld beach and small mesh seines. They are often found in areas of medium to strong tidal action. Small blackfish like small cobble stone and kelp

beds and gravitate to larger ledges and bolder size reefs as they mature. Blackfish are slow growers and therefore subject to both habitat failures and overfishing. Tautog take three to five years before they are able to reproduce, and may measure just under a foot long. They have teeth! When pier fishing I would watch large adults ingest small mussels and barnacles, chew them and expel just the shell. To those who have watched this process must agree it is truly amazing. One evening just before dark, I watched as dozens of blackfish would jump up to grab a mussel off exposed rocks and roll back to consume them. The slow-growing aspect is a concern to fishing managers (two inches/year). A 20-inch fish can be about a decade old. The carrying capacity for various habitat types is unknown although some general guidelines suggest larger fish inhabit larger more pronounced reefs. A factor is that once blackfish reach six years growth, a 20 year-old blackfish may measure only an inch longer than a 10 year old. A 14-inch fish is six to eight years old.

Fishing mortality compounds the problem- natural causes account for ten to fifteen percent and fishing mortality excludes catch/release and portions of injured and undersized fish that may eventually perish at close to 80%, leaving a small fraction only, 10 to 5%, to reproduce. Ten times as many fish are caught by hook and line than by commercial gears; blackfish are thought to live more than 30 years and reach lengths of up to three feet. Their long life spans and relatively slow growth after 10 years slows population restoration opportunities. It is especially critical that fish can survive 0-6 months and be allowed to mature. Fishery management has placed a huge emphasis upon ensuring that large numbers of fish survive long enough to reproduce, and spawning programs of aquaculture management practices places a great emphasis upon juvenile survival of seed or fry. That has allowed survival percentages for much greater than what could be expected in the "wild." To restore populations faster, we need to do both, as each alone does not guarantee success. The blackfish collapse does offer an interesting case study as catches alone do not fully tell the whole story. Large biomasses tend to produce "bumper crops" at regular intervals, called the "boomerang effect." A high peak in adult, reproductive capacity populations should show a similar bounce at the time these fish enter the fishery. A look at landing statistics does not show this. This could be the result of habitat failures for small fish.

The question is, with a high fishery catch in 1984-1988, abundant spawning for recruitment factors should have been at high levels. At ten years for a fish to be long enough to enter the fishery years 1997, 1998 would reflect spawning and recruitment success ten years earlier. There appears to be more gaps in year class recruitment that

might indicate large failures in survival of year two/three fish at least here in Connecticut. Although not proven, CT did experience at the time widespread eutropic events and several inshore bays and coves went anaerobic in the summers of 1987-1988 and 1989. Areas to five feet deep appeared to have low or no oxygen as seine surveys during the time yielded few or no fish. Small blackfish may have been driven from the protective cover and preferred critical habitat during this period. While fishing effort remained high, recruitment replacements to the fishery did not. Several studies that overall indicate from the loss of this sub tidal habitat population abundance is linked to the carrying capacity of essential habitats at critical life cycle states. For example, you could have very successful adult blackfish spawning but if the young of the year habitat was eliminated or degraded a failure for that year can occur. This may have happened as nitrogen enhanced waters accelerated plant and algae growth in several harbors during this period one of the worst hit was Clinton Harbor. A deeper more oxygen rich habitat may be suitable if shallow areas are to be subject to nitrogen enhanced plant growth and lower than normal oxygen levels. Small fish would then need to compete again against large fish or be subject to new/predated prey relationships beyond normal or heritage values. Therefore, that should guide placement of any new artificial reefs. My 1975 proposal was for new deep water reefs. I encourage the State to apply for the permits now for shallow ones, these in waters 25 to 35 feet deep which should be safe from hypoxia events now frequent in shallow bays with sluggish tidal exchange. In other words, some of the shallow near shore habitats have been degraded to such a point we should undertake action to conduct some habitat mitigation measures, one of which includes shallow habitat creation experiments for blackfish.

Connecticut has, to my knowledge, resisted this concept for the past three decades. We should try however; it can't get much worse, let's conduct limited artificial reef experiments and carefully record the results for the first three years.

It is estimated that each year 500 to 1,000 concrete "New Jersey" road barriers are retired from cracks, damage and pin failure: if only they could be brought to a central state highway facility for future recycling into small artificial reef targeting juvenile refuge habitat for tautog. Smaller certainly than those 1970's Hartford sidewalk slabs, but fine for smaller blackfish, the habitat it seems needs additional carrying capacity today. If successful, larger, deeper reefs for tautog should be also considered.

Benefits to Connecticut

Tautog is one of the most rewarding and good tasting of all fish sought in Connecticut's recreational fishing. It is also one of the healthiest to consume, its flesh is free from most contaminants absorbed in oil rich fish, like bluefish. It is a renewable natural resource that brings several economic benefits to our state.

The recreational fishery is popular for those fishing from shore such as Meigs Point, groin in Madison, a large manmade breakwater at the east end of Hammonasset Beach. Most black-fishing in the summer months occurs in relatively shallow waters from small boats, making inshore reefs accessible to most small boat owners. Sales of bait, tackle and related goods and services complement the economic benefits of recreational fishing which have been well documented and need no further explanation.

Costs

The state has recently enacted a recreational saltwater fishing license and for the first time collects a user fee for access to recreational fishing. I have supported such licensing for decades under the promise those fees are put back into the fishery. If possible perhaps a small portion this revenue could be put into this small proposed artificial reef project.

Other Projects – Experiments

Neighboring states, such as Rhode Island have experimented with artificial reefs, Forrester 2003-2006 reports on six 1 meter wide by 20 meter long reefs made of granite cobbles constructed in 1997. All have been successfully colonized by various reef associated fish. Other experiments in Mount Hope Bay have shown positive results for tautog. Conversations with John Baker in the early and late 1970's included the fact that oyster grow out beds and hard clam beds supported young tautog. This was confirmed in the mid 1980's with a small hydraulic clam operation. This field study included divers and included the use of small mesh installed inside the dredge. The use was to demonstrate that the clam bed had obtained a dense set of hard shell clams about the size of a dime, too small to be retained in the commercial dredge. Before the actual dredging commenced, several dozen tautog gathered under the vessel. Apparently they had patterned to the sound of the pump and quickly gathered underneath awaiting the commencement of clamming. It was long thought by hard shell clam fishermen that tautog feed on exposed clams from harvest operations in Connecticut. We concluded that the bed had millions of small clams and tautog had just come to the dinner bell. Tautog like structure, so population enhancement on local reefs could provide good local fisheries for them. Shellfish beds both oyster and clam may have also provided critical

habitat in the past including for small lobsters and also deserves further study (see John Bakers comments submitted to the Connecticut Nature Conservancy).

Conclusion

To mitigate for the loss of this inshore critical habitat, the State of Connecticut should investigate the feasibility of commencing a habitat restoration (enhancement) reef program for Blackfish. Rhode Island has conducted several studies which appear to be promising, “Why not Connecticut”?

In my opinion, we should at least try.

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