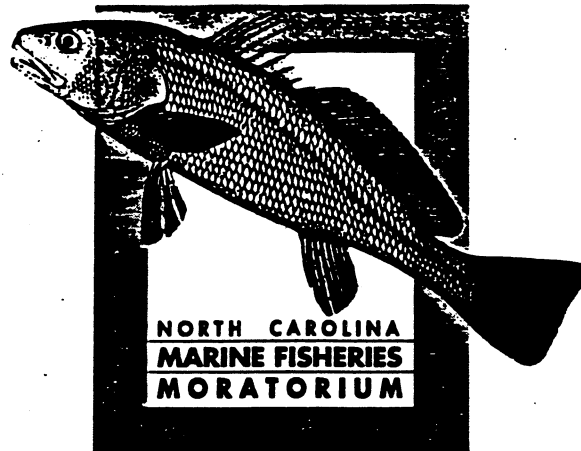


Appendix H. Habitat Subcommittee recommendations to the North Carolina Marine Fisheries Commission concerning the habitat impacts of specific commercial and recreational gears used in North Carolina.



FINAL REPORT
OF THE
FISHERIES MORATORIUM STEERING COMMITTEE
TO THE
JOINT LEGISLATIVE COMMISSION ON SEAFOOD AND AQUACULTURE
OF THE
NORTH CAROLINA GENERAL ASSEMBLY



NORTH CAROLINA SEA GRANT COLLEGE PROGRAM
UNC-SG-96-11

Habitat Subcommittee Report

The Habitat Subcommittee proposals as a whole received more supportive comment from speakers at the Committee's public meetings than any other set of recommendations, because there is a widespread consensus that critical coastal fisheries habitats have been substantially degraded in North Carolina. To solve this problem, the Habitat Subcommittee proposes, as the linchpin of its recommendations, that Department of Environment, Health, and Natural Resources Divisions having habitat and water quality responsibilities prepare a joint Coastal Habitat Protection Plan ("HPP"), which must then be implemented, through rulemaking, by the State's principal environmental Commissions. HPP sections will delineate and establish restoration and protection strategies for critical coastal fisheries habitats, with a goal of "no net functional loss" of each habitat. In addition, under the recommendations a dedicated "Habitat Staff" will be established in the Division, processes will be implemented to provide for public and private protection of critical fisheries habitats, a statewide citizen water quality monitoring program will be established, and all state agencies will be required to ensure that agency rules and policies do not significantly contribute to the loss of habitats critical to coastal fisheries.

Appendix I: Habitat Subcommittee Recommendations to the North Carolina Marine Fisheries Commission Concerning the Habitat Impacts of Specific Commercial and Recreational Gears Used in North Carolina.

DESCRIPTION OF GEAR	RECOMMENDATIONS		
	Habitat Impact & Recommendations	Bycatch Impact & Recommendations	Protected Species Impact & Recommendations
<p>Hook and Line: The customary "rod and reel" method of fishing, used as the "up and down" bottom rig in the reef fish fishery. "Electro-mate" reels are customarily used for rapid line retrieval.</p>	<p>Virtually no habitat impacts, but see comments at right on monofilament fishing line and other relevant equipment. No recommendations at present.</p>	<p>Some bycatch impacts. A fishhook cannot be attuned to a size limit or a prohibited species, but generally, a catch-and-release policy works fairly well. Some species do not respond well to being caught, and some deep-water species do not survive being taken. Commercial and recreational fishermen tend to leave an area where the catch is predominately undersized. No recommendations at this time.</p>	<p>Some impacts. In 1995, one stranded turtle had a fishhook that had entered its body through the eye socket. Mammals and turtles will from time-to-time take a bait and are damaged somewhat in the release process. There is some entanglement with discarded monofilament line. Recommend promoting education and regulation on disposal of fishing line.</p>
<p>Trolling Gear: Fishing lines attached to a reels or directly to a boat and "trolled" through the water. Used when fishing for king mackerel, tuna, etc.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>Slight bycatch impacts. The problems that exist are generally caused by a prohibited species or an undersized fish taking the bait. Usually these can be released successfully. No recommendations at this time.</p>	<p>Some impacts, as from discarded fishing line. The biggest potential problem is perhaps from boat propellers. Recommend promoting education and implementing regulations on the discarding of monofilament fishing line.</p>
<p>Long-line System: Fishing lines used for top-water, underwater or bottom fishing.</p>	<p>Virtually no habitat impacts when used as a top-water gear. Impact of bottom gear can range from minor on sand bottoms to significant when used in live rock (coral) formations. Recommend that bottom gear should be prohibited in coral formations.</p>	<p>Same problem as with any "hooking" system (no selectivity). Since this gear holds captured catch in place for attack by predators, timeliness in checking the long-line can decrease bycatch. No recommendations at this time.</p>	<p>Little is known about the impacts of this gear on sea turtles and marine mammals, but sea turtles are more prone to be attracted to the bait (or captured fish) from surface longlines than are other protected species. No recommendations at this time.</p>
<p>Trot Line: Lines used in estuarine waters to catch crabs and fish, consisting of a long multi-or monofilament line baited at intervals, with or without hooks, used much like an ocean long-line.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Cast Net:</p>	<p>No known habitat impacts. No</p>	<p>No known bycatch impacts. No</p>	<p>No known impacts. No recommendations at this time.</p>

<p>Small net thrown by hand and used to catch "schooled fish", such as mullet, and used by bait-fish dealers and individual fishermen to net bait-fish and shrimp.</p>	<p>recommendations at this time.</p>	<p>recommendations at this time.</p>	<p>dations at this time.</p>
<p>Long haul seine: Usually a long seine, heavily leaded (weighted) and dragged by boats in estuarine waters to catch fish.</p>	<p>No bycatch impacts when catch is culled immediately. Recommend that immediate culling of the catch be required.</p>	<p>Some damage to SAV beds may occur from the heavily leaded bottom line being dragged through the grass beds. Damage to SAV beds by the boat motor propellers may be significant in shallow waters. There is concern over the use of this gear in PNAs (where use is currently prohibited) and near oyster rocks. Recommend: (1) a study be implemented to determine the actual bottom damage and whether the damage is short-term or long-lasting; (2) all oyster grounds, PNAs, and SAV beds be permanently marked; and (3) a study be conducted into the effects of long haul seine activities in these areas.</p>	<p>No impacts when catch is culled immediately. Recommend that immediate culling of the catch be required.</p>
<p>Hand Seine: Small mesh net used to catch bait. Usually pulled by hand, but sometimes a boat is used to spread the seine.</p>	<p>Some bycatch impacts, in that virtually all of the directed and incidental catch from hand seines would be considered bycatch in other fisheries. "Fingerlings" and juvenile foodfish are retained for use as bait. There is typically an intense hand seining effort made in the winter and early spring targeting juvenile mullet for crab bait and bait for red drum fishermen. Recommend a study to demonstrate: (1) how to make use of "scrap" fish for bait, (2) which juvenile fish are reasonable to use as bait, and (3) how to make better use of artificial bait.</p>	<p>No known habitat impacts. Recommend increasing allowable hand seine sizes to thirty (30) feet.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Beach Seine: Net generally used to corral mullets. A beach seine can also be used on such fish as striped bass and spot. Sometimes a beach seine is used in conjunction with a "stop"</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>

<p>net. Net usually spread around fish with a boat and then pulled to the shore. Pulling power can be by hand or by vehicle. This is one of the most historic methods of fishing.</p> <p>Fish Pot: A wire trap having directed (one-way) openings whereby fish may enter to get to bait. Fish pots are generally used in the ocean harvesting of black sea bass. Fish pots are also used to harvest catfish in the Albemarle Sound area.</p>	<p>Very little habitat impact. Impact can increase in coral formations. "Lost" pots become habitat when used correctly with biodegradable panels. Pots in estuarine waters do not adversely affect oyster grounds or SAV beds. Recommend that biodegradable escape panels be required for all fish pots.</p> <p>No known habitat impacts. If escape panels are used, the lost pots become habitat. Okay to use in SAV beds or oyster grounds. Recommend that biodegradable escape panels be required for eel pots.</p>	<p>Very little bycatch impact when used for a targeted species such as black sea bass. Either the mesh size of the pot or proper size culling rings or panels can insure proper size catch. Recommend mesh size or culling ring consistent with fish size requirements.</p> <p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Eel Pot: A wire trap that looks like a crab pot, but has smaller wire mesh.</p>	<p>Very little habitat impact. Main habitat impact is from discarded bait cartons. It is generally okay to use crab pots in SAV beds, PNAs or oyster grounds. Anecdotal reports indicate the use of anti-fouling solution or "cleansing" solutions aboard boats or near the waters edge to treat crab pots. Also anecdotal evidence exists to indicate that zinc used in crab pots to minimize rusting may contribute to heavy metal pollution in estuarine systems. Recommend: (1) a requirement that bait boxes be returned to shore; (2) a requirement that biodegradable escape panels be used in crab pots [Note: There is work being done that indicates that "tagged" crabs left in a crab pot with no food subsequently appear in other baited pots]; (3) prohibition of the use of any</p>	<p>There is a small bycatch, usually small flounders that become food for crabs. No recommendations at this time.</p>	<p>Some concern over the diamondback terrapin as a species of special concern. A study is underway by the N.C. Wildlife Resources Commission to address these concerns. No recommendations at this time.</p>
<p>Crab Pot: A wire trap similar to a fish pot. This is the usual method for catching crabs in North Carolina.</p>	<p>Very little habitat impact. Main habitat impact is from discarded bait cartons. It is generally okay to use crab pots in SAV beds, PNAs or oyster grounds. Anecdotal reports indicate the use of anti-fouling solution or "cleansing" solutions aboard boats or near the waters edge to treat crab pots. Also anecdotal evidence exists to indicate that zinc used in crab pots to minimize rusting may contribute to heavy metal pollution in estuarine systems. Recommend: (1) a requirement that bait boxes be returned to shore; (2) a requirement that biodegradable escape panels be used in crab pots [Note: There is work being done that indicates that "tagged" crabs left in a crab pot with no food subsequently appear in other baited pots]; (3) prohibition of the use of any</p>	<p>There is a small bycatch, usually small flounders that become food for crabs. No recommendations at this time.</p>	<p>Some concern for impacts to diamondback terrapin as a species of concern. No recommendations while study being conducted by the N.C. Wildlife Resources Commission is ongoing.</p>

	anti-fouling solution aboard a vessel or within seventy-five (75) feet of the shoreline; and (4) a study of the effects of zinc used to coat crab pots in terms of estuarine pollution.		
Shrimp Pot: A wire trap used as a special type of underwater trap or pot to catch shrimp.	No known habitat impacts. Okay to use in SAV beds, PNAs or oyster grounds. No recommendations at this time.	No known bycatch impacts. No recommendations at this time.	No known impacts. No recommendations at this time.
Ocean Sink Gill Net: These are offshore gill nets that may be heavily anchored or not, as is appropriate to the area and fishery.	Sink nets have very little habitat impact unless gear becomes entangled with live rock formations. Lost or discarded webbing can become a danger for continued fishing until webbing becomes encrusted. Recommend better, more positive identification of net owners.	Gill nets are very selective as to size. Problems arise when a fishery is pursued near striped bass stocks, such as the dogfish shark and weakfish fisheries. Recommend mandatory attendance of nets when there is a significant potential for bycatch and size limits are not compatible, or when an incidental catch quota is not available.	Some impact from contacts with marine mammals and sea turtles. No recommendations at this time.
Ocean Drift Net: Usually a monofilament gill net constructed so as to be tended from the top down. Ocean drift nets generally utilize a larger mesh size than bottom fishing nets. There is very little, if any, use of this gear in the ocean off North Carolina.	No known habitat impacts. No recommendations at this time.	Very little bycatch impact. Recommend mandatory attendance of nets when there is a significant potential for bycatch, such as in the dogfish shark and weakfish fisheries.	Surface fishing and usually larger mesh sizes make these nets subject to problems with marine mammals and sea turtles. Recommend that attendance be required at all times.
Fyke Net: A usually round net having a series of throats. Fyke nets are primarily used in the upper reaches of estuaries.	No known habitat impacts. No recommendations at this time.	Fyke nets are not a very selective net, but have little or no bycatch impact if culling at the scene is required. Recommend that immediate culling of nets be required.	There are some concerns with diamondback terrapins being taken in fyke nets. No recommendations at this time.
Trammel Net: A multi-walled net usually made with two outer walls of large mesh (6" to 12" stretch or more) made of heavy gauge monofilament, and an inner wall of small mesh monofilament. A fish "pockets" itself between the walls.	Only impact is from lost or discarded nets. Recommend that better, more positive identification of net owner be required.	Trammel nets are not a very selective net, but have little or no bycatch impact if culling at the scene is required. Recommend that immediate culling of nets be required.	No known impacts if on-scene culling is required. Recommend that immediate culling of nets be required.
Pound Net: A passive gear using netting "leads", which	No known habitat impacts. The poles used to support the pound net leads	Mesh size in pound nets can be changed to select different sized fish	There is some contact of pound nets with sea turtles, but they are easy to

<p>the fish travel along to a net "pound", where they are captured. Captured fish can be culled alive. Mesh size in the pound can be fish size selective. This gear known also as "weirs", and is one of the oldest methods of fishing. Some states have specific laws protecting weirs.</p>	<p>and pound are permanent structures that can themselves become habitat, but abandoned or broken-off poles can become a hazard to navigation. No recommendations at this time.</p>	<p>and there should be no bycatch impacts from pound nets. Any bycatch can be culled live as the pound is emptied. Culling panels are required in flounder pounds. Recommend that pound net catches be required to be immediately culled and that flounder cull panels remain required.</p>	<p>release unharmed. No recommendations at this time.</p>
<p>Channel Net: A passive gear built like a shrimp trawl that is anchored in a specific area. Channel nets are used to catch shrimp in areas with strong tidal flow, which is required to hold the net open.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>There should be very little bycatch impact from channel nets. Recommend that catch should be culled frequently at the catch site. Culling at the dock should not be allowed.</p>	<p>There may be some contact of channel nets with protected species, but marine mammals and sea turtles can either swim back out of the net or can be easily released. No recommendations at this time.</p>
<p>Hand Clam Rake: A tool that usually has nine (9) teeth or less, and looks a lot like a garden rake. Most rakes have a handle, but they can consist merely of "metal fingers" that rest at the wrist and extend over the fingers. Clam rakes can be utilized to "scratch" for clams under water or for "signing" on tidal flats at low tide.</p>	<p>Very little habitat impact in most areas, but slight impacts occur in SAV beds. Clam rakes are difficult to use on most oyster rocks, but impact can be great when used to pull oysters into piles in order to get at the clams beneath. Recommend that: (1) no rakes be allowed in marked oyster rocks/beds [these oyster areas would be designated "clam seed management areas"]; and (2) during the normal oyster season, clams should be allowed as an unlimited, approved, incidental catch when harvesting oysters.</p>	<p>No known impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Hand Clamming: Refers to the clamming method wherein clambers are in the water on their hands and knees feeling for clams. Clammers typically use latex gloves as protection for their hands, but can use the "metal hands" noted under "Clam Rake", above.</p>	<p>Very little known habitat impact. Hand clamming is generally okay in SAV beds. Recommend that hand clamming on marked oyster grounds be prohibited except as part of the normal oyster season.</p>	<p>No known impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Bull Rake: A large, heavy clam rake, usually having eighteen (18) to twenty-eight (28) teeth. Handles range from ten (10) feet to forty (40) feet long.</p>	<p>Bull rakes have severe habitat impacts when used on oyster rocks, and can damage SAV beds. Recommend that bull rake clamming on marked oyster grounds and SAV beds be prohibited.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>

<p>Gig: A spear with or without barbed points at its tip, used mostly to spear flounder at night, using underwater lights.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>No bycatch impacts unless intentional. No impact should be tolerated. No recommendations at this time.</p>	<p>No impacts unless intentional. No impact should be tolerated. No recommendations at this time.</p>
<p>Spear: Similar to a gig, but usually single pronged, used by underwater divers using scuba gear.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>No bycatch impacts unless intentional. No impact should be tolerated. No recommendations at this time.</p>	<p>No impacts unless intentional. No impact should be tolerated. No recommendations at this time.</p>
<p>Oyster Tongs: Hand held steel "forceps", typically used while standing in a boat to recover oysters from water ranging in depth from that barely deep enough to float a boat to ten (10) to twelve (12) feet.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Clam tongs: Hand held steel "forceps", used to recover clams from any and all types of bottom. Clam tong teeth tend to be longer and more closely spaced than the teeth on oyster tongs.</p>	<p>Some habitat impact in SAV beds. Impacts on oyster beds may be negated if clam and oyster seasons are combined at some future point. Recommend that clam tongs be prohibited on marked oyster rocks except during oyster harvest season.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Oyster Dredge: Usually heavy, large-toothed cages towed by a vessel to recover oysters from deeper waters. Oyster dredges are currently allowed only in Pamlico Sound, with a one-hundred (100) pound weight limit.</p>	<p>Habitat impacts of oyster dredges can be significant. Historically, such dredges have been used only on bottoms that were oyster beds. Dredges can plow down any mounds of shellfish and should not be allowed for use in SAV beds. Recommend maintaining present limits on usage and that steps be taken to ensure that the gear is used with adequate consideration of its habitat impacts.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Sea Scallop Dredge: An extremely heavy steel cage similar to an oyster dredge, that drags the bottom and is used in the ocean. These dredges are intended for use only on beds of scallops at sea.</p>	<p>These dredges have severe habitat impacts. Recommend that dredges continue to be prohibited in estuaries and on live bottom formations offshore [Note: This fishery is regulated under a federal FMP, and its impacts are not presently an issue in NC].</p>	<p>Flounder bycatch possible. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Bay Scallop Dredge: A fairly light-weight (not >50 lbs.) steel</p>	<p>Very little habitat impact. It is generally okay to use these dredges in SAV</p>	<p>Small bycatch of "conchs" and pink shrimp. No recommendations at this</p>	<p>No known impacts. No recommendations at this time.</p>

<p>frame, without teeth, used in estuarine waters, and that has an attached, nylon webbing bag to accumulate the catch.</p> <p>Patent Tongs: Very large steel "forceps" typically used to recover oysters from deep water.</p>	<p>beds over a short scallop season. No recommendations at this time.</p> <p>The use of patent tongs is thought to have a major effect on shellfish beds and the bottom generally. Recommend collection of information on this gear, e.g., the habitat impact experiences of other states which have or are presently allowing use of patent tongs.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Clam Kickers: Generally refers to the use of the propeller of a boat to blow the mud/silt off the clams and into a trawl having a heavy steel cage or bag made of rings. The gear is chained so that it plows up the clams as it is towed behind the vessel. Often the stern of the vessel is loaded so that the propeller "wash" is directed at a downwards angle.</p>	<p>The use of clam kicking has severe habitat impact on all bottoms. The gear causes severe damage to SAV beds and to oyster rocks. Recommend that gear continue to be prohibited in SAV beds and over marked oyster grounds.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Hydraulic Clam Dredge: Gear generally used to harvest clams, that employs a conveyor system that can be lowered to the bottom where jets of water uncover the clams. These dredges are allowed only in "mechanical clamming" areas. The gear is also used by mariculturists to harvest shellfish crops from their public bottom leases.</p>	<p>The use of this gear has severe impacts upon SAV beds and oyster grounds. Recommend that areas that may be used by these dredges not be expanded in public trust areas. However, employment in mariculture operations to recover shellfish crops should be considered a viable use of the gear if leases are located in an areas where the gear is already allowed, if adjacent leases would not be affected. Permits should be issued by the Division of Marine Fisheries on a case-by-case basis. During the oyster season, legal size oysters caught incidental to clamming should be allowed to be retained.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Purse Seine: Large net used to catch menhaden. A menhaden school is surrounded by the purse net and a large weight is then dropped to close, or "purse", the bottom of the net.</p>	<p>The use of purse seines has no habitat impacts as the net is fished entirely within the water column. No recommendations at this time.</p>	<p>Studies have shown that bycatch in the menhaden industry from the use of purse seines is extremely minimal. No recommendations at this time.</p>	<p>Purse seines have minimal impacts on threatened and endangered species. No recommendations at this time.</p>

<p>Estuarine Gill Net: A major gear used in North Carolina's internal coastal waters that captures fish by entangling them when they swim into the net. The net is often anchored to the bottom or attached to stakes. In some fisheries, gill nets are fished by drifting with the current. A variety of mesh sizes are used to take spot, flounder, American shad, river herring, mullet, striped bass and many other species. This gear is often used by recreational fishermen.</p>	<p>Estuarine gill nets have negligible habitat impacts. Such gear can be safely used in PNAs, SNAs and SAV beds. Proper identification of gear owners should be emphasized, along with regular tending of the gear to avoid wastage of fish. No recommendations at this time.</p>	<p>This gear is very size-selective, but there can be problems in capture of non-targeted species of similar sizes to the target species. Large catches can occasionally occur in gill nets used to fish recreationally, resulting in waste of part of the catch. Attendance of such recreationally fished nets may be appropriate under some conditions to minimize bycatch. No recommendations at this time.</p>	<p>There is a potential for this gear to impact marine mammals, principally bottlenose dolphins, and sea turtles. As more information becomes available on the distribution and movements of protected species, management actions may be needed to alter traditional fishing practices to avoid interactions between such species and estuarine gill nets. No actions are needed, or recommended, at the present time.</p>
<p>Otter Trawl: A cone-shaped net fashioned in one of the many patterns of "Otter Trawls", used primarily in North Carolina to catch shrimp. The gear is pulled from behind or alongside a vessel using "doors" or "gates" to keep the trawl open. The doors are sized (18" x 36" to 40" x 120") and weighted (50 lb. to 500 lb.) in direct ratio to the size of the trawl. Trawls skim the bottom, and shrimp are made to "pop" up into the net by a "tickler" chain pulled just ahead of the bottom line. Trawl doors ride along the bottom.</p>	<p>For all bottoms, the severity of habitat impacts from the use of shrimp trawls is related to the size the doors. Damage to oyster grounds is generally moderate to high. Studies are inconclusive on the question of whether trawling in other areas has significant habitat impacts. Recommend continuation of prohibition of trawling in marked oyster grounds. A study of the impact of trawling on different types of habitat should also be conducted.</p>	<p>Fish bycatch is the major issue related to trawling for shrimp in the State. The Division of Marine Fisheries, the N.C. Sea Grant Program and the National Marine Fisheries Service, in a cooperative effort with fishermen, have been addressing the bycatch issue for several years, by studying shrimp trawl bycatch under actual shrimp conditions. Since October 1992, North Carolina has required some sort of "finfish excluder" in all shrimp trawls. One study has demonstrated bycatch reduction rates averaging better than 50%. Experiments continue and currently indicate an even better reduction rate is possible. Recommend continued prohibition of trawling in PNAs, SAV beds, and, generally, in Special Secondary Nursery Areas. Also recommend that the State continues to fund and study excluder devices and require their use.</p>	<p>North Carolina shrimpers fishing in the Atlantic Ocean are required to equip each trawl with a Turtle Excluder Devices (TED). Compliance with this provision appears to be total. The only exemption in the United States to TED requirements is the area between Rich's and Brown's inlets in Pender County, North Carolina. Shrimpers in this area must adhere to seasonally adjusted "tow times" set by the NMFS. All other inside water shrimpers must use TEDs, unless they adhere to a thirty (30) minute tow time and have no form of mechanical advantage to retrieve their nets. No recommendations at this time.</p>
<p>Crab Trawl: A trawl consisting of larger mesh nets made like a shrimp trawl. The basic equipment is the same as a shrimp trawl except that the bottom leading edge of the trawl is faced with several loops of heavy chain so that the crabs are "plowed" out of the bottom where</p>	<p>The use of crab trawls has severe impacts on all bottoms, causing great damage to oyster grounds and moderate to severe damage in SAV beds. Crab trawling results in substantial sedimentation in the trawled area. Recommend that crab</p>	<p>Present tailbag size causes a high percentage of undersized flounder to be killed and catch of a high percentage of undersized crabs. Recommend the DMF adopt a 4 1/2" tailbag for use in this gear [Note that South Carolina uses a 4" bag].</p>	<p>This trawl is used inshore in the winter, where waters are cold. For that reason, there is no known impact of this gear on sea turtles. No recommendations at this time.</p>

<p>they have embedded themselves.</p>	<p>trawls be prohibited in marked oyster grounds. Because of heavy chain at the mouth of these trawls, there was much concern over potential damage to SAV beds. For that reason, also recommend a study of the effects of crab trawling on SAV beds.</p>	<p>No recorded bycatch problems, but potential remains. Recommend implementation of requirement that a tailbag be dumped and culled every thirty (30) minutes.</p>	<p>No recorded problems. The tailbag of this gear can be dumped at any time, which eliminates most of the concern over bycatch or endangered species. Recommend implementation of requirement that a tailbag be dumped and culled every thirty (30) minutes.</p>
<p>Skimmer Trawl: A trawl nets that utilizes a solid frame and a flat offshore "foot" in order to push a trawl through the water without using doors. Use of this gear is limited to areas where the depth of the water is no more than the size of the metal frame. Its use is highly successful in the "white shrimp" fishery.</p>	<p>Little known habitat impact. Skimmer trawls are generally okay to use in SAV beds, but should not be used in oyster grounds. Recommend that trawls be prohibited in marked oyster grounds and that the more widespread use of this gear be promoted in estuarine waters.</p>	<p>This gear should have no bycatch impacts if the tailbag is dumped and culled at least every thirty (30) minutes. Recommend implementation of the requirement that trawls be culled every thirty (30) minutes.</p>	<p>No known impacts if frequent culling occurs. Recommend implementation of requirement of culling every thirty (30) minutes.</p>
<p>Butterfly Trawl: In this gear, a solid frame holds a modified trawl in the top of the water column, acting like a channel net. Its use generally requires a good tidal flow and it is normally used only at night.</p>	<p>No known habitat impacts, but there have been complaints that these netters have failed to yield to boat traffic when working the Atlantic Intracoastal Waterway and marked channels. Recommend that the use of butterfly trawls be promoted, with a requirement that netters must yield to all boat traffic when utilizing navigation channels.</p>	<p>There should be no bycatch impacts if the tailbag is dumped and culled frequently. However, the nets cannot be checked until the tow is completed, so concerns about bycatch and endangered species impacts still remain. Recommend further study of bycatch of float nets and imposition of appropriate tow times.</p>	<p>None if frequent culling occurs. Recommend further study of bycatch of float nets and imposition of appropriate tow times.</p>
<p>Float Netting: This is done when a shrimp trawler "floats" its doors so that it can act as a butterfly or channel net, usually occurring in ebb tidal flow and at night.</p>	<p>No known habitat impacts, but complaints have been received of float nets being used in a manner that blocks navigation channels, and of failure to yield to boat traffic. Recommend that float netters be required to yield to boat traffic.</p>	<p>Historically, flynets have landed large amounts of small, juvenile fish, too small to be marketed as seafood. This catch was sold for a variety of uses, such as animal food, and such harvests may have a long-term, adverse impact on fish stocks. Recommend a</p>	<p>Federal rules require TEDs in the ocean flounder trawl fishery. No recommendations for state action at this time.</p>
<p>Fish Trawls/Flynets: Usually large trawl nets, generally fished in ocean waters. Fish trawls may drag on the bottom, but also may utilize "mid-water technology." Fish trawling is not allowed in inside waters in North Carolina.</p>	<p>Use of this gear can seriously damage live rock formations. Recommend the continued prohibition of use in inside (internal) coastal waters. Federal rules should address the use of flynets in the EEZ.</p>	<p>Historically, flynets have landed large amounts of small, juvenile fish, too small to be marketed as seafood. This catch was sold for a variety of uses, such as animal food, and such harvests may have a long-term, adverse impact on fish stocks. Recommend a</p>	<p>Federal rules require TEDs in the ocean flounder trawl fishery. No recommendations for state action at this time.</p>

<p>Stop Net: [See "Beach Seine", above] A term used for large mesh nets that are set out or "run" perpendicular to the beach. Stop nets are not intended to catch anything themselves, given that the mesh size in these nets is from six (6) to ten (10) inches. During the night, migrating mullet (or other fishes) gather against the stop net, which they perceive as an obstruction to travel. Other species may either swim through the stop net or go around it. A beach seine is used to gather the fish "encamped" at the stop net site. A recent DMF study showed that ninety-five percent (95%) of the fish "encamped" at the stop net are mullet.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>prohibition on the targeting, retaining and selling of food fish that are below a size marketable for human consumption.</p>	<p>No known impacts, except that marine mammals can become entangled in stop nets. No recommendations at this time.</p>
<p>Explosives: Pyrotechnic devices, such as dynamite, used to create a concussion, which causes the stunned or dead fish to rise to the surface where they are gathered. The use of explosives to fish is not legal in North Carolina.</p>	<p>Habitat effects of this practice are unknown, but would seem to potentially be significant. Recommend that this practice continue to be prohibited in North Carolina.</p>	<p>Any fish within the area of influence of the concussion will be affected. Recommend that practice continue to be banned in North Carolina.</p>	<p>No known impacts, but the potential impacts would appear to be significant. Recommend that the practice continue to be banned in North Carolina.</p>
<p>Electric Shocking: Refers to the use of mechanical devices that generate an electric current into coastal fishing waters, which stun the fish and cause them to rise to the surface. The practice of electric shocking is currently allowed only in a portion of the Cape Fear River, where it is used to catch catfish.</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>Any fish within the area of influence of the charge will be shocked and stunned. Recommend that such a fishing practice be restricted by area and only allowed by special permit.</p>	<p>No known impacts. No recommendations at this time.</p>
<p>Dip Nets/Pier Net: Hand nets that are not usually used to catch fish by themselves, but rather, are used as tools in conjunction with other fishing gears. For example, a flounder fisherman may use a dip net to scoop up a flounder that is in his</p>	<p>No known habitat impacts. No recommendations at this time.</p>	<p>No known bycatch impacts. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>

<p>net but appears ready to fall out, or a fisherman may use a pier net to bring up catches of mullet too large to lift without danger of splitting his cast net, or to lift other species to keep from breaking the line on his fishing rod. However, large dip nets are used to catch river herring and shad in coastal streams.</p>			
<p>Crab Dredges: A crab dredge is much like an oyster dredge, except perhaps with longer teeth, and is used to dredge crabs from the bottom sediments during the winter months. Crab dredges are used in northern North Carolina waters from Long Shoal north.</p>	<p>Habitat impacts from the use of crab dredges can be significant, and the gear causes severe damage on oyster grounds or in SAV beds. Recommend that the current restrictions on the use of this gear be maintained, and that steps be taken to ensure that crab dredges are used with adequate regard to their effects on coastal fishery habitats.</p>	<p>Oysters and clams taken incidentally by this gear can be returned to the water if appropriate. No recommendations at this time.</p>	<p>No known impacts. No recommendations at this time.</p>

