A GUIDE TO FISHING AND DIVING NEW JERSEY REEFS

THIRD EDITION

- Revised and Updated
- DGPS charts of NJ's 17 reef network sites, including 3 new sites
- Over 4,000 patch reefs deployed

DEPARTMENT OF ENVIRONMENTAL PROTECTION NEW JERSEY

SPORT FISH RESTORATION

New Jersey Division of Fish and Wildlife

A GUIDE TO FISHING AND DIVING NEW JERSEY REEFS

Prepared by:

Jennifer Resciniti
Chris Handel
Chris FitzSimmons
Hugh Carberry

Edited by:

Stacey Reap

New Jersey Department of Environmental Protection
Division of Fish and Wildlife
Bureau of Marine Fisheries
Reef Program

Third Edition: Revised and Updated

Cover Photos:
Top: Sinking of Joan LaRie III on the Axel Carlson Reef.
Lower left: Deploying a prefabricated reef ball.
Lower right: Bill Figley (Ret. NJ Reef Coordinator) holding a black sea bass.

Acknowledgements

The accomplishments of New Jersey's Reef Program over the past 25 years would not have been possible with out the cooperative efforts of many government agencies, companies, organizations, and a countless number of individuals. Their contributions to the program have included financial and material donations and a variety of services and information. Many sponsors are listed in the Reef Coordinate section of this book. The success of the state-run program is in large part due to their contributions.

New Jersey Reef Program Administration

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John S. Watson, Deputy Commissioner
Amy S. Cradic, Assistant Commissioner

Division of Fish and Wildlife
David Chanda, Director
Thomas McCloy, Marine Fisheries Administrator
Brandon Muffley, Chief, Marine Fisheries
Hugh Carberry, Reef Program Coordinator

Participating Agencies

The following agencies have worked together to make New Jersey's Reef Program a success:

FEDERAL

U.S. Fish and Wildlife Service
U.S. Coast Guard
U.S. Army Corps of Engineers
National Oceanic and Atmospheric Admin.
National Marine Fisheries Service
U.S. Navy Reserves
U.S. Customs Service
U.S. Environmental Protection Agency

STATE

N.J. State Police
N.J. State Police Marine Bureau
N.J. State Agency for Surplus Property
N.J. Land Use Regulation Program
Southern State Correctional Facility
N.J. Army National Guard

COUNTY

Ocean County Bridge Department
Ocean County Department of Corrections
Cape May Municipal Utilities Authority

MUNICIPAL

Atlantic City Bomb Squad

AUTHORITIES

Delaware River Port Authority
Port Authorty of New York and New Jersey
New York City Transit Authorty

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New Jersey's Reef Program

New Jersey's sea floor consists of sandy plain with some mud and clay interrupted by submarine ridges. Within this relatively featureless and barren sea floor are 17 reef sites that encompass more than 25 square miles. These reefs range in size from one-half to four square miles and are strategically placed along New Jersey's 120-mile coastline near navigable inlets. Contained within these reefs are more than 4,000 "patch reefs", which are premier underwater real estate for more than 150 species of fish and marine life. New Jersey's Reef Network is unparalleled along the entire Atlantic Coast and is recognized nationally as having some of the best artificial reefs in the nation.

How Reefs Work

New Jersey's reefs are only artificial in that hard substrate structures were intentionally placed in the marine environment. Everything that occurs after that is a natural process leading to formation of an encrusting community of organisms. The encrusting phenomenon occurs because ocean water contains a living soup of larval filter feeders such as mussels, barnacles, hydroids, sponges and corals that actively seek out hard substrate to attach, grow and mature. These encrusting organisms attach themselves permanently to hard surfaces, using strong threads or cement to hold themselves in place. The attachment is so strong they remain in place during northeast storms, tropical depressions and hurricanes. Although some reef organisms resemble plants, like the seaweeds found on jetties and bulkheads, reef organisms are animals and do not photosynthesize. The average depth of New Jersey's reefs is greater than 50 feet where there is insufficient sunlight for photosynthesis to occur. The encrusting organisms are filter feeders that sustain themselves by filtering plankton and detritus that drift by.

Larval encrusting organisms cannot attach to sand grains, which quickly wash away or become covered by sediment. Deployed hard reef materials such as rock, concrete or steel become quickly encrusted and a living reef matrix envelopes the structure. This matrix can be several layers thick as different types of encrusters compete for an available toehold, often growing on top of each other. At this stage of reef development, a multitude of minute crustaceans, amphipods,

isopods, crabs, shrimps and snails take up housing in this protective matrix and form an important component of the food chain.

In terms of numbers and weights, fishes represent a small portion of the marine life found on reefs. A nine-year study on marine life colonization conducted by New Jersey Division of Fish and Wildlife showed that fishes only accounted for 4.5 percent of the biomass of reef marine life. Young-of-the-year demersal fishes such as tautog and black sea bass represented 1.2 percent of the total biomass and adult fishes represented 3.3 percent of the total. The most abundant group, forming the base of the food chain, are the sessile invertebrates such as blue mussels, barnacles, anemones, bryozoans, hydroids, tube worms and coral. These organisms account for 84.5 percent of the total reef biomass. Fishes feed on the attached and mobile invertebrates. In a healthy ecosystem, forage animals are much more abundant than the apex predator. The high forage biomass recorded for New Jersey's reefs suggest they are a healthy and productive habitat for marine fishes.

Deployed reef structure not only leads to more food for marine fish, but also increases the energy efficiency of reef feeding by dissipating underwater currents. The structure acts as a baffle, reducing current along the bottom, which allows energy from food to be used for growth rather than exertion. Additionally, as water flows over and around reef structure, eddies form, which carry food to waiting fishes.

Marine Fish Use of Reef Habitat

Some marine fish species require reef habitat to survive while others gain a direct benefit from reef habitat but can survive with out it. The following information discusses how bottom or demersal fish, baitfish and pelagic fish relate to reef habitat.

Demersal (Bottom) Fishes

Bottom dwellers such as black sea bass and tautog need reef habitat to survive. Black sea bass and tautog typically cluster under overhangs, cavities and crevices found on the reef. The nooks and crannies found in the reef matrix provide hiding areas and refuge from larger predatory fishes. These areas also provide an eclectic menu of mobile food such as rock crabs and

shrimp. As well as blue mussels and barnacles which are grazed by tog and cunner and other reef species. Reef fishes make excursions away from the food abundant reefs to feed on worms and clams and other fauna living in or on the open sandy bottom. Soon after feeding however, they return to the safety and refuge of the reef.

Schooling Baitfish

For unknown reasons, schools of baitfish such as menhaden, round herring and anchovies school around high-profile reef structure like sunken ships. Theories as to why this occurs, include these species using the high profile structure as a point of reference and using the structure's shadow to conceal themselves from roving predatory fish. Schooling baitfishes only stay near the reefs temporarily and eventually move off to other areas.

Pelagic Fishes

Pelagic (open water) species such as bluefish, amberjack, cobia and sharks are at the top of the reef food chain and use the reef as nothing more than a fast food restaurant. They are attracted to the teeming bait and other swarming fishes found around the reefs. Pelagic predators are only transients and reefs are not a requirement of their life cycle.

Key to Reef Materials

Dredge Rock

More than 90 percent of the reef material deployed by New Jersey's Reef Program is rock. This rock is obtained from dredging operations. The rocks range in size from chips to boulders as big as cars. The rock is dropped on predetermined locations via hopper scows. Various types of rock, including sandstone, granite and igneous are deployed to create underwater rock piles, rock mountains and ridges.

Rock Piles

The rock piles range in size from 300 feet long by 75 feet wide with a vertical relief

of four to six feet from the sea floor. Each icon represents one single pile.

Rock Mountains and Rock Ridges

Rock mountains are created by dropping dozens of hopper scow loads of dredge rock in a single location, resulting in a mountain that rises between 30 to 60 feet from the sea floor. Rock ridges form a continuous segment of relief along the bottom.

Demolition Concrete

The Reef Program routinely deploys concrete obtained from the demolition of bridges, sea walls and piers. This material can vary in size from boulder-sized pieces to monoliths that are as large as ten feet in length. The concrete is deployed from massive 200-foot deck barges and is pushed off piece by piece by heavy machinery such as a front-end loader. Typically, a marker buoy is set at the deployment location and a tugboat pulling the deck barge circles the buoy as the concrete is broadcast over a wide area. Multiple loads are dropped on top of each other to provide higher vertical relief from the bottom.

Concrete Castings

Concrete castings include culverts, junction boxes and many other types of prefabricated concrete structure. Usually, this material has a slight defect such as a crack or chip that makes them unsalable by the manufacturer. Concrete castings are very effective reef material due to their hollow cavities and surface area which provide many nooks and crannies for fish and lobster to hide in.

Reef Balls

A Reef Ball is a designed habitat that resembles a small igloo with many holes leading into a hollow interior cavity. In 1998, seven fiberglass molds were purchased to fabricate the concrete Reef Balls. In 1999, construction of reef ball habitats began at Southern State Correctional Facility using inmate laborers. Annually, 500 habitats are fabricated and deployed on reef sites. Fish count studies performed by scuba divers have shown that on average, more than 19 fish

will occupy or be found near a reef ball habitat.

Army Tanks

In 1994 the U.S. Navy, Coast Guard, Army and Navy Special Forces, Air Force and New Jersey National Guard began providing obsolete military vehicles for reef construction activities. Obsolete army vehicles such as M-60 and M-551 tanks, M-331 armored personnel carriers and M-578 crane vehicles were cleaned and prepared at Fort Dix by the New Jersey Army National Guard. During the six year program, a total of 397 obsolete army vehicles were placed on 11 reef sites.

Subway Cars

Subway cars are structurally complex and Redbird cars have proven to be a fully functioning safe habitat, offering trophic support to fishes by supporting invertebrate communities. Removing the doors and windows allows fishes to swim into the interior for refuge and currents to circulate. Obtained free of cost from the New York City Transit Authority, more than 250 Redbird subway cars have been deployed on six reef sites. Fish count studies have determined that on average, 323 fishes will utilize each deployed subway car.

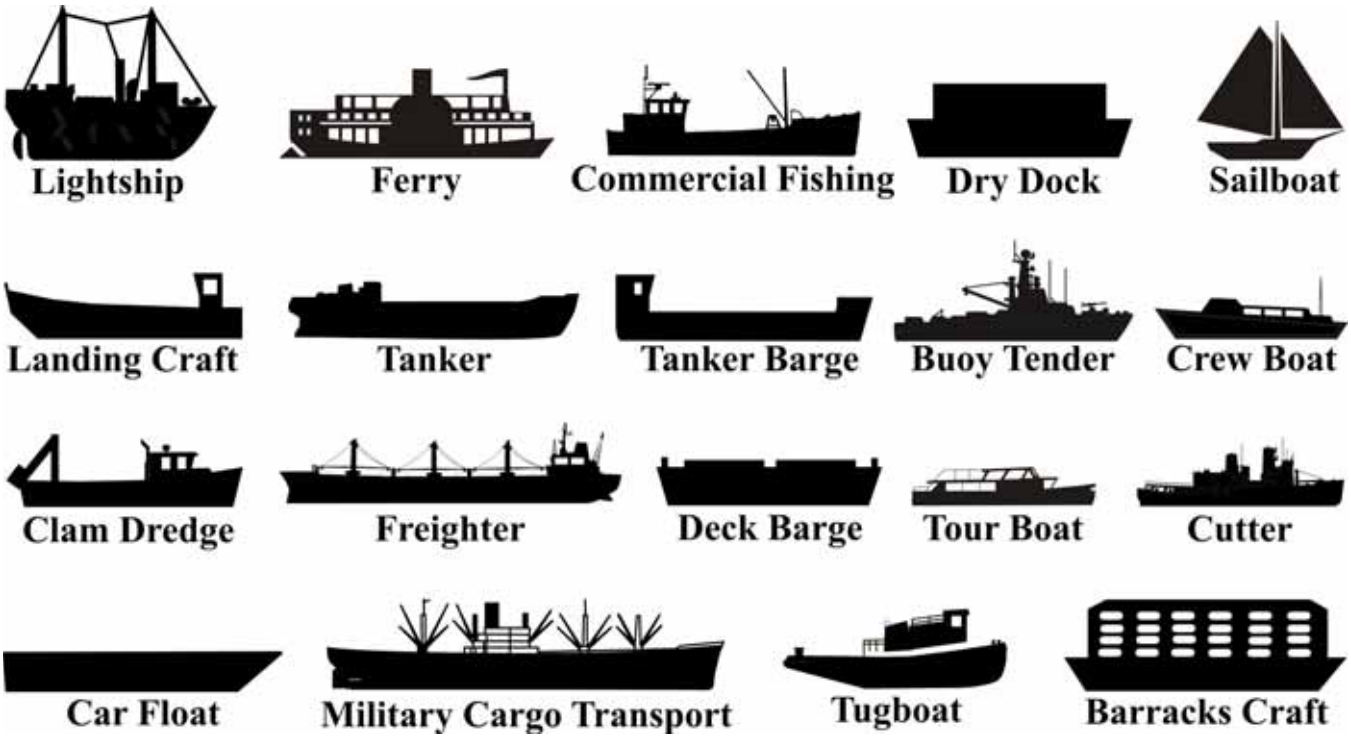
Uncharted Wrecks

A few uncharted shipwrecks are found within the boundaries of reef sites. These vessels sank though storms, wars or accidents before the advent of New Jersey's Reef Program. No written information is provided for the uncharted wrecks in this book.

Uncharted Snags

Uncharted snags are obstructions on the sea floor that are, in most cases, reported by commercial fishermen who have snagged their nets. Generally, little is known about the origin, type and exact location of uncharted snags.

Vessels



A variety of vessels have been sunk on New Jersey's reefs, including ferry boats, tugboats, trawlers, tankers and many more. To date, 162 vessels have been deployed on New Jersey's reefs. The vessels range in size from 32-foot U.S. Coast Guard crew boats to the 460-foot attack cargo transport the "Algol." Vessel icons are numbered so they can be identified. Each icon represents a single vessel. Consult the coordinates pages to determine the date sunk, name, size and type of vessel indicated by the icon. Each icon represents a single vessel. The orientation of the icon on the chart does not represent the orientation of the vessel on the sea floor.

How to Use the Reef Charts

The charts in this publication depict New Jersey's 17 artificial reefs sites that include two reef sites, Del-Jerseyland Inshore and Del-Jerseyland Offshore, a joint venture between the states of New Jersey, Delaware and Maryland. The symbols in the preceding key indicate the type of material used to build each patch reef within these reef sites. Uncharted wrecks, snags and structures unintentionally placed on the sea floor are also depicted. The structures are not drawn to scale of the chart dimensions and in most cases cover a much larger portion of the chart than the corresponding materials do on the actual reef site. Named patch reefs or reef structures are identified on the charts by a number. To find the exact differential global positioning system

(DGPS) coordinates of the numbered patch reef, consult the structure listing immediately following each chart.

Drift Fishing Areas

Anchoring overtop reef structure is an excellent method for catching tautog and black sea bass during the spring and fall. However, this technique requires a certain degree of experience and can be difficult for the beginner or novice to master. Conversely, drift fishing is easy to perform and can provide an immediate return to the novice angler. When summer flounder are present on reefs (mid-summer through fall), drift fishing is the method of choice to put fish in the box for beginners and experts alike. To be an effective drift fisher all that is required is knowledge on the location of deployed reef structure. These locations should be drifted over as the wind and current move the boat along. Depending on the reef site, many targets can be drifted over in one pass, thereby increasing your chances of success. Although drift fishing areas within reef sites contain structures such as reef balls, culverts and buoy sinkers that are not as likely to snag your terminal tackle, be prepared to get hung up occasionally on the bottom and possibly lose rigs. The loss of rigs while fishing on reefs goes with the territory.

Some of New Jersey's reefs were designed specifically for drift fishing and others have a designated drift fishing area within the reef site. The designated drift fishing areas are designed to provide a defined drift fishing area and the remainder is where boats can safely anchor and scuba divers can explore wrecks without the threat of being snagged by fishing gear.

Depth Contours

The third edition Reef Guide contains depth contours of the reef sites' sea floor. The depths were obtained by running transects on the reef and recording the depths. The contours are to be used as a reference tool and not a navigational aid.

Maximum Reef Profile

Located on each reef chart you will see a box containing the maximum reef profile for

that particular reef. The Army Corps of Engineers sets the maximum relief depth allowed on the individual reef sites. The actual depths vary from reef site to reef site.

Reef Site Coordinates

The DGPS coordinates provided in this book were obtained through direct observation, i.e. by finding each structure at sea and then recording its exact location from LORAN C and DGPS receivers. Older patch reef coordinates were obtained using LORAN C devices. More recent reef drops were recorded with DGPS machines. The 3rd edition contains only DGPS charts.

To convert the earlier reef deployment coordinates that were obtained solely from LORAN C devices into DPGS, two techniques were used. Most of the conversions were obtained by on site observations. If an on site observation was not possible, mathematical equations were used to convert from Loran C into DGPS. Unfortunately, while close, these conversions are usually not accurate enough to find reef structures. The exact locations of structures can usually be found by using a wreck search patterns. See page 13 for more information on wreck search patterns.

Help Us Correct Mistakes

Every effort was made to provide the best available information on the positioning of reef structures. However, there are many variables that may result in some degree of error for some reef structures. Users are encouraged to notify the Reef Program of suspected errors and provide correct coordinates by calling (609) 748-2020.

Report Uncharted Wrecks on Artificial Reef Sites

Fishermen and divers are encouraged to report the coordinates of any uncharted wrecks or snags located on New Jersey reef sites by calling the Reef Program at (609) 748-2020. Providing coordinates of uncharted wrecks will help ensure reef material will not be deployed on historic wrecks.