Artificial Reef Research

DIVER'S HANDBOOK

TP - 63

FLORIDA SEA GRANT COLLEGE PROGRAM
research, extension, and education for a better coastal environment
This handbook is dedicated to Edward A. Kalakauskis, a tireless reef research diver and sports fisherman "volunteer", who has been the common thread that helped make all this possible.

It is further dedicated to the memory of three "Artificial Reef Pioneers" whose work will long benefit fisherman and divers off the Northeast Florida coast:

Linden Heston - Jacksonville Offshore Sport Fishing Club

Richard "Dick" Longo - Daytona Beach Sport SCUBA Diver

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Artificial Reef Research

Diver's Handbook

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Preface

Artificial reef construction in Florida is largely a result of volunteer efforts. Historically, volunteer reef builders have had difficulty evaluating the success of their efforts since divers were usually not called upon to observe the reef material after placement. If divers were available, they generally had little or no training in objective underwater data gathering and documentation methods. Properly trained sport divers can assist reef builders by providing feedback information and documentation. Volunteer reef research divers can provide a valuable public service, not otherwise available from state or academic institutions, by establishing their own reef research, monitoring and documentation projects and storing this information in a publicly accessible reef data archive.

The purpose of this Artificial Reef Research Divers Handbook is to provide background information and guidelines for sport divers:

1) to gather information about their community’s artificial reefs;
2) to document and store this information in a way that can be retrieved and understood by the reef builders, government agencies, the research community, other interested volunteer organizations and the public;
3) to communicate their observations in a credible fashion.

The handbook is organized into two primary sections. Section I consists of thirteen chapters which discuss the theoretical and practical aspects of physical and biological data collection underwater, project planning, training, public relations, setting up an archive and organizational structure of a reef research team. Section II is what might be called the "recipe" section or "Underwater Research Methods Summaries". It, like any recipe book, provides step by step guidelines for various underwater data gathering methods.

Scientific Diving, to gather information (Data) underwater is NOT merely jumping in the ocean, looking around and reporting back to the surface what the diver "thinks" is going on "down there". It is the establishment and use of SYSTEMATIC and STANDARDIZED procedures for gathering OBJECTIVE information which is added to the DIVE LOG and the data ARCHIVE. It may include the collection and preservation of specimens for a REFERENCE COLLECTION, as well as the making of detailed REEF SCATTER MAPS and systematic MARINE ORGANISM POPULATION SURVEYS. It may include MONITORING, through documented photographs, video surveys and systematic photo transect surveys over long periods of time to capture changes which otherwise might remain unobserved. LEADERSHIP, PLANNING and COMMUNICATIONS is at the heart of a successful underwater research program, whether it is done by professional scientific divers or volunteers.

This handbook will not make the reader a research scientist! Professional academic degrees and training are needed to conduct credible marine science. Becoming a marine scientist requires the completion of degree work at a college and university. This cannot be achieved in a single extension course, handbook or dive shop training program.

This is NOT a handbook on diving technology. No attempt is made to discuss methods of diving, diving theory, new life support equipment or technique. There is no discussion about rescue or emergency procedures, except to say that such procedures should be established on any dive. There are many "Dive Manuals" available to fulfill these needs.

There is considerable discussion about safety procedures which might be different from those practiced in sport diving, and APPENDIX A is a reference to the Scientific Dive Standards adopted by the American Academy of Underwater Sciences. Any research diving activity should seriously consider the adoption of these standards to their underwater research activities.

There is discussion about the need for the scientific dive teams to establish organizational procedures to safely conduct a research dive operation and insure the data is preserved. Chapter 11 on "Project Management" provides a thorough discussion about how to organize a research dive expedition, to include logistics and descriptions of specific job assignments. Chapter 12 discusses how to establish an "Archives and Reference Collection" to preserve the data and Chapter 13 discusses how to organize a "Reef Research Team."

The underwater research methods included should not be construed as the "only" or even the "best" method for gathering the type of data discussed. Good science methodology depends on the nature of the question that is being asked, the technology available to get the data and the situation it is to be collected in. Often, the questions will change as new information is made available; as the technology changes and the situation in the field changes. The intent of this "Section II - Underwater Research Methods Section" is merely to provide ideas as a basis for deciding what data gathering strategies might be used in a reef research project. Each "Method" should be adjusted to meet the users situation.

Section II should continue to grow. I encourage the reader(s) to develop, field test and write their own Underwater Research Methods Summaries and share them with others through the Florida Sea Grant Extension Program. This can be accomplished by copying the blank Underwater Research Methods Summary form, found at
the beginning of Section II, filling it in and mailing it to:

Florida Sea Grant Extension Program
Building 803
University of Florida,
Gainesville, FL 32611.

The Appendix of this handbook is a collection of supporting materials that should help the readers to start their own reef research program. It, like the "Methods Summaries", should be used as a guide only, and modified to suit the users needs.

The "Artificial Reef Research Divers Handbook" should help volunteers to take the first step in the scientific method - MAKE AN OBSERVATION about their communities' artificial reefs and DOCUMENT IT. It is specific in that it focuses on underwater data collection methods with basic SCUBA equipment normally used by sport divers. It uses simplified methodology found in a number of science disciplines. It is unique in that it concentrates on teaching volunteers how to design, lead and store information for THEIR OWN artificial reef documentation projects. Its practical end is aimed at improved reef monitoring and construction programs through volunteerism.

The Florida Sea Grant Extension Programs, Artificial Reef Research Divers Training Program and this Handbook, would not be possible were it not for the many volunteer scientists, sport divers, fishermen, citizens and agency people who willingly gave their time and energy to this effort. The workshops held since 1980 was dependent on those individuals who freely gave their weekends, boat time and equipment in support of this activity. To all of you volunteers who helped, too numerous to list here, we offer this "Thank You!" We owe a special thanks to the original students who graduated from this training, for in many respects, you were the "Guinea Pigs" in this grand experiment. The program would have failed without your patience and dedicated spirit.

In any program, a few individuals always stand out for their extra dedication to the project. Foremost, is Ed Kalsteikis, to whom this Handbook is dedicated. Ed, a graduate of the first workshop in Daytona, has continued to be deeply involved with all the training programs since, and is the connecting strand between the reef builders and reef research divers. He continues to freely give volunteer time to all reef activities throughout the North East Florida region, serving as an inspiration to all.

I would also like to recognize and thank Dr. Quinton White, Jacksonville University, who, without compensation, freely gave his time and talents to this program, from the very beginning. He has kept a sincere interest in the projects of its graduates and serves as their academic advisor. He has provided additional extension training in Invertebrate Biology for the Jacksonville Scubanauts Research Team.

Others who deserve special thanks for supporting the training and keeping the program growing include: Don Serbousek, Thiele Wetzel, Dan O'Brien, Pete Hiebrechts, H.C. "Hap" Jones, Dick Starke, Halifax Sport Fishing Club and Ormond Anchor Chasers Dive Club from the Daytona Beach area; Jim Netherton, Larry Mahn, George Miller, Rick Holmblad, Gene Burns, Kevin McElroy, Bill Kerr, Ancient City Gamefish Association, N.E. Florida Martin Association, Camachee Cove Marina, Sea Hunt Enterprises Dive Shop from St. Augustine; and Aquifer Dive center of Jacksonville. Some individuals willingly provided leadership during the early stages of this program and include: Bob & Joy Engel, Dennis & Wendy Short, Larry Tipping, Don Landis, John Hammond, Marilyn Halusky, Jim Powell, Beth Stawbridge, Mark & Kim Ulman, Gideon Carpenter, Gary Kirkland, Jacksonville Offshore Sports Fishing Club, Jacksonville Scubanauts Dive Club, Aquifer Dive Center from the Jacksonville area; Leon Duprene from Brevard County and Mike McAllister from Nassau County. I apologize for any omissions from this list and regret that I cannot list all the volunteers who have helped make this program the success that it is. To all I offer my warmest "THANKS"!

A special thanks goes to Ms. Ginger Layton Popel and Ms. Janice Fiockins, for their tireless and patient labors in assembling this manuscript.

There are a few "Artificial Reef Pioneers" who are no longer with us. They each deserve special recognition for much of their thinking is found in this handbook. Perhaps, their pioneering work will live on through this publication. We will never forget them. They include:

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Linden Heston
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Reef Committee and one of the early reef
builders in Jacksonville.

We, the authors, wish continued progress and success for all who are involved and concerned with the wise management of our marine habitat resources.

Joe G. Halusky
September, 1991