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The Sarasota Dolphin Research Program in 2020: Celebrating 50 Years of Research, Conservation, and Education

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The Sarasota Dolphin Research Program (SDRP) engages in research, conservation, and education activities to benefit cetaceans in Sarasota Bay, Florida, and elsewhere around the world. The SDRP conducts the world's longest-running study of a wild dolphin population. Bottlenose dolphin (*Tursiops truncatus*) research in Sarasota Bay was started in 1970 by Blair Irvine, who refers to himself as an "accidental marine mammalogist" (see Blair's "Historical Perspectives" essay in this issue). While Blair may have entered the nascent field of marine mammalogy "accidentally," there was nothing accidental about his contributions to the field—they came about from his curiosity, insight, ingenuity, and perseverance. The "natural laboratory" situation he created with the dolphins of Sarasota Bay continues to have far-reaching conservation impacts and provides unique opportunities for advancing the field.

The information available from five decades of research on Sarasota Bay's long-term, year-round resident community of individually identifiable bottlenose dolphins established this as a unique natural laboratory for learning about the biology, behavior, ecology, health, and communication of dolphins, as well as the effects of human activities on them. The Sarasota dolphins attract researchers and students from around the world to address questions that are impossible to answer elsewhere in the absence of such detailed background information.

Long-term study is crucial for understanding the lives of members of long-lived species such as bottlenose dolphins, and for being able to detect trends in populations relative to changes in their environment. SDRP research in Sarasota Bay has discovered dolphins up to 67 years of age, spanning as many as five concurrent generations, living in an area where the human population and numbers of boats have quadrupled over the past five decades. Identifying dolphin responses to human activities and environmental changes is necessary for providing appropriate and adequate protection measures for the dolphins to allow them to survive and thrive in Sarasota Bay and elsewhere.

The SDRP engages in conservation activities to benefit cetaceans at scales ranging from local to international. Studies of local Sarasota dolphins have led to greater understanding of the impacts of human activities such as pollution, fishing, provisioning, and vessel disturbance and collision, providing guidance to wildlife management agencies to develop strategies for enhanced protection. Findings from Sarasota Bay dolphins have been used to understand the plights of dolphins in more at-risk populations elsewhere in the United States. The expertise of the SDRP has been employed to benefit endangered cetaceans around the world through consultations, conservation capacity building, and collaborative research projects.

Education, training, outreach, and information dissemination are important components of SDRP activities. To date, 43 doctoral dissertation and 41 master's thesis projects have benefited from association with our program through field research opportunities or access to data, samples, or guidance from staff. More than 430 undergraduate interns have received training since 1991. We have provided training opportunities for more than 100 researchers and students from more than 30 countries in dolphin research techniques that are now being applied to species of conservation concern around the globe. SDRP staff members have been involved as senior authors or co-authors for four books, more than 270 peer-reviewed journal articles and book chapters (see the "Supplemental Material" section on the *Aquatic Mammals* website for a publications list: https://www.aquaticmammalsjournal.org/index.php?option=com_content&view=article&id=10&Itemid=147), more than 100 technical reports, and 13 popular or semi-popular pieces. They have been the presenter/co-author of more than 440 conference presentations and more than 280 public or university lectures.

The SDRP has positively impacted cetaceans at multiple levels. In the U.S., the National Oceanic and Atmospheric Administration (NOAA) has used the findings of the SDRP to improve their protective measures for bottlenose dolphins throughout the southeastern part of the country. They also use the Sarasota dolphins as a reference population for comparisons with more at-risk populations to identify and define impacts of natural and anthropogenic phenomena such as the *Deepwater Horizon* oil spill and red tide (harmful algal blooms). Techniques, approaches, and tools developed, tested, and refined with Sarasota dolphins have greatly enhanced research capabilities. Training and education opportunities afforded by the SDRP have increased conservation capacity in the U.S. and in many countries around the world. Along the west coast of Florida, the SDRP leads and participates in rescues of entangled and out-of-habitat dolphins; these rescues leverage future generations of dolphins and help to maintain populations. The information derived from detailed studies of the behavior, health, and ecology of the Sarasota dolphins benefits the care of dolphins in zoological parks and aquaria around the world.

The Sarasota Bay dolphins have taught us a great deal over the past five decades. Our discovery of multi-decadal, multi-generational, year-round residency set the stage for all of our future research efforts, as well as establishing a basis for NOAA protective measures. Knowing the long-term geographic range of a population allows the measurement of exposure to threats, which, in turn, facilitates mitigation. The ability to observe identifiable individual dolphins of known sex, age, and familial relationships through all of their life history milestones and associated transitions in behavioral and social patterns, to collect data on health and condition, and to then document their reproductive success and cause of death is rare in cetacean research. We discovered that their society, though generally composed of fluid groupings within a resident community, includes complex and long-lasting associations such as strongly bonded male pairs and extended associations of mothers and calves well beyond nutritional weaning, showing indications of cultural transmission of knowledge. We have learned that these dolphins are truly our neighbors, and what we do to the neighborhood affects them as well as us. As they breathe the same air as we do, swim through the same waters, and catch and eat the same fish, but in larger quantities, they are strong sentinels of coastal ecosystem health. As the efforts of the SDRP continue beyond the first 50 years, we look forward to being able to help improve the conditions in the neighborhood we share with the dolphins, to their benefit and our own.

Four long-term resident Sarasota mothers and their calves. Three of these mothers, and their calves, would likely not have been available for the photo if not for interventions by the SDRP and collaborators.