

Focus of the Research

- To identify sounds that can possibly be used to warn manatees of approaching watercraft
- To study manatee behaviors and vocalizations associated with environmental stimuli, and with manatee pairing, food consumption, and daily & seasonal circadian rhythm
- To study differences between male and female manatee behaviors and vocalizations
- To identify captive manatee vocal signatures, and identify their mode of vocal transmission



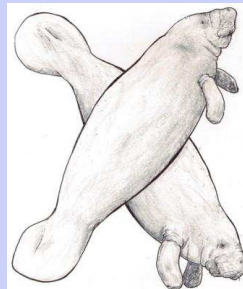
Slip & Little Joe

Vocalization study at the Cincinnati Zoo & Botanical Garden

Captive Florida Manatee Acoustical & Behavioral Research



Midwest Florida Manatee Research Project



www.xu.edu/manateersearch

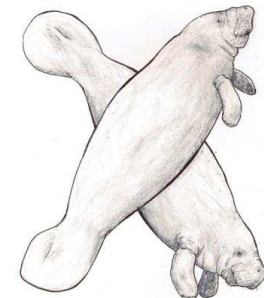
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Midwest Florida Manatee Research Project



Acoustical & Behavioral Research

Endangered Species

Despite a life expectancy of about 60 years, and Federal & State protection as an endangered species, the Florida manatee (*Trichechus manatus latirostris*)



©Photo Courtesy of the Florida Fish & Wildlife Conservation Commission

Many Florida manatees are injured or killed each year largely due to boat propellers and collisions with boat hulls.

population is low and can dwindle quickly. Manatee calf mortality is high, and females typically only give birth to one calf every two to three years.

Consequently, their death rate is higher than their birth rate. Recent deaths have been attributed to factors such as; cold stress;

red tide; collisions with watercraft; blockage in their digestive tracts from swallowing debris in the water; entanglement in debris; and other human related factors.

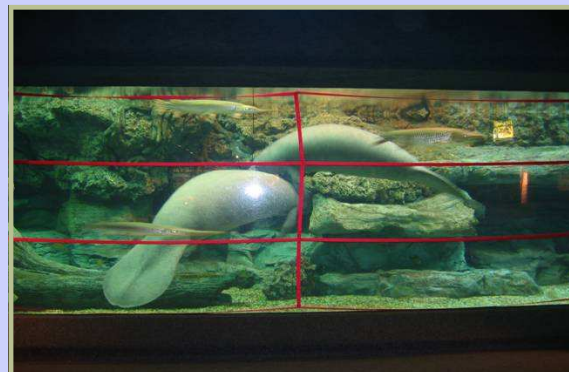
Researchers periodically do counts of the manatee population, and injured, rehabilitated manatees are now being tagged with satellite transmitters before release to monitor their progress and to assist with the study of manatee behavior in the wild. Because Florida manatees live in rivers and estuaries throughout Florida, many of which contain murky water, it is difficult to get an exact manatee population count. According to the Florida Fish & Wildlife Conservation Commission's 2006 synoptic survey, the current estimate is approximately 3,300.

Xavier University Research

Xavier University Department of Biology Professor Dr. Charles J. Grossman became interested in helping to save the endangered Florida manatee and founded the *Midwest Florida Manatee Research Project*. With permits from the U.S. Fish & Wildlife Service, he and a team of biology students, and staff from several other departments (Physics, Audio Visual, and Mathematics), began studying the behavioral responses of captive Florida manatees housed at the Cincinnati Zoo & Botanical Garden and the Columbus Zoo & Aquarium when they were exposed to ultrasonic and audible frequencies.

Because many manatees are injured or killed each year by collisions with watercraft in Florida, the initial intention of the study was to determine if there was a sound that could be transmitted into the water that would warn manatees of the approaching watercraft. While this goal of the research is ongoing, the study has now expanded to include other aspects of captive manatee behaviors & vocalizations, and will soon include manatees housed in additional facilities located throughout Florida.

Ohio is one of only three states outside of Florida to house manatees



Slip & Little Joe

Behavioral Research Grid at the Cincinnati Zoo & Botanical Garden

Manatees in the Study

As of 2008, the *Midwest Florida Manatee Research Project* has involved a total of thirteen different Florida manatees located at the Cincinnati Zoo & Botanical Garden, and the Columbus Zoo & Aquarium: Douglas, Stoneman, Dundee, Gene, Hurricane, Snorty, Turtle, Rodeo, Slip, Little Joe, Holly, Willoughby, and Stubby.

Federal law requires that all Florida manatees are only to be held in captivity if they are too ill or injured to be returned to the wild, or until they are fit enough to be returned to the wild. As of April of 2008, eight of these manatees have already been released: Douglas, Turtle, Snorty, Rodeo, Stoneman, Dundee, Gene, and Hurricane.



Dr. Charles Grossman & Jeff Johnson

Vocalization study at the Cincinnati Zoo & Botanical Garden

Acknowledgements

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