

Manatee Resources *continued from page 7*

Scientific Papers *continued*

- Hartman, D.S. 1979. Ecology and behavior of the manatee (*Trichechus manatus*) in Florida. *Am. Soc. Mammal. Spec. Publ.* No. 5. Lawrence, KS. 153 pp.
- Langtim, C.A., O'Shea, T.J., Beck, C.A., Pradel, R. 1998. Estimates of annual survival probabilities for adult Florida manatees (*Trichechus manatus latirostris*). *Ecology* 79(3): 981–997.
- Marmontel, M. 1995. Age and reproduction in female Florida manatees. Pages 98–119 in O'Shea, T.J., Ackerman, B.B., Percival, H.F. (Eds.) *Population biology of the Florida manatee*. National Biological Service Information and Technology Report No. 1. Washington, DC. 289 pp.
- Marmontel, M., Humphrey, S.R., O'Shea, T.J. 1997. Population viability analysis of the Florida manatee (*Trichechus manatus latirostris*) 1976–1991. *Conserv. Biol.* 11(2): 467–481.
- Marmontel, M., O'Shea, T.J., Kockman, H.I., Humphrey, S.R. 1996. Age determination in manatees using growth-layer-group counts in bone. *Mar. Mammal Sci.* 12(1): 54–88.
- O'Shea, T.J., Reep, R.L. 1990. Encephalization quotients and life-history traits in the sirenian. *J. Mammal.* 71(4): 534–543.
- Reid, J.P., Rathbun, G.B., Wilcox, J.R. 1991. Distribution patterns of individually identifiable West Indian manatees (*Trichechus manatus*) in Florida. *Mar. Mammal Sci.* 7(2): 180–190.
- Reynolds, J.E., Wilcox, J.R. 1994. Observations of Florida manatees (*Trichechus manatus latirostris*) around selected power plants in winter. *Mar. Mammal Sci.* 10(2): 163–177.

Magazine Articles

- Behler, D.A. 1996. Manatee update. *Wildlife Conservation* 99(4): 16–21.
- Behler, D.A. 1996. Travelin' man. *Wildlife Conservation* 99(2): 72.
- Beckhorn, S. 2000. Manatee ranger. *Highlights for Children* 55(9): 20–21.
- Buckingham, C.A., Lefebvre, L.W. 1999. Manatee response to boating activity in a thermal refuge. *Wildlife Society Bulletin* 27(2): 514–523.
- Chadwick, D.H. 1995. Dead or alive: The endangered species act. *National Geographic* 187(3): 2–41.
- Davidow, B. 2001. Helping manatees in a tangle. *Outdoor Life* 207(3): 15–17.
- Domning, D.P. 1981. Manatees of the Amazon. *Sea Frontiers* 27(1): 18–23.
- Domning, D.P. 1983. Marching teeth of the manatee. *Natural History* 92(5): 10–11.
- Domning, D.P. 1987. Sea cow family reunion. *Natural History*. 96(4): 64–71.
- Hall, A. 1984. Man and manatee: Can we live together? *National Geographic* 166(3): 400–413.
- Helping the manatee. Oct. 1983. *National Geographic World*. Page 10.
- Leutwyler, K. 1996. Manatee mystery. *Scientific American* 274(6): 24–33.
- Man meets manatee. 2000. *Current Science* 86(1): 1.
- Motalvalli, J. 1997. Manatee mania. *E Magazine: The Environmental Magazine* 8(2): 46–48.
- Murphy, M.J. 1983. Manatee talk. *Omni*. Volume 5. Page 45.
- O'Shea, T.J. 1994. Manatees. *Scientific American* 271(1): 66–72.
- Pain, S. 1996. Where manatees may safely swim. *New Scientist* 2039: 22–30.
- Rattner, R. 1990. Manatees among us. *Animals* 123(4): 26–31.
- Rattner, R. Feb./Mar. 1990. The ugly mermaids. *Express*. Page 6.
- Rhodes, V. 1994. Meet the manatee. *Sport Diver*. Premier Issue. Pages 64–71.
- Rose, P.M. 1985. The West Indian manatee. *Audubon Wildlife Report*. Page 540–546.
- Stewart, D. 1999. Making sense of manatees. *National Wildlife* 37(3): 40–47.
- Sundquist, F. 1998. Look out below! *National Geographic World* 276: 12–16.
- Vallee, J. 1994. Manatees and boats: A collision course. *The Florida Naturalist* 67(4): 15–17.
- Walsh, K. 1989. Manatees. *Ranger Rick*. 23(6): 4–9.
- Wartski-Crane, M. June 1991. Water baby. *Boys Life*. Page 30.
- Wiley, J.P. Sept. 1987. Manatees lure us to the deep. *Smithsonian*. Page 92.



Save the Manatee® Club

25 Years of Protecting Manatees

Dear Educator,

Public awareness in Florida has increased dramatically since 1975 when the manatee was first designated as the state's aquatic mammal. Today, manatees have captured the attention of many people – not only in Florida, but also across the United States and internationally as well.

Manatees: An Educator's Guide provides current information on the West Indian manatee and related species as well as strategies for teaching about this endangered animal. Information about manatee physiology, behavior, habitat, related species, causes of mortality and efforts at conservation is included. Of course, a problem with a single species is often a problem interrelated with our environment and the natural resources on which we commonly depend. While this guide focuses on the West Indian manatee, the importance of interdependencies within the whole ecosystem should also be emphasized. We hope that the use of this guide will result in informed decisions, responsible behavior, and constructive actions toward the protection of manatees and their habitat.

We encourage you to copy and distribute the material in this insert and the accompanying guide. Activities are designed for multidisciplinary study areas and can be adapted to suit the special needs, ages and abilities of your students. In addition, be sure to visit the Save the Manatee Club Web site on the Internet where we have supplementary manatee information and links to other sources. If you have further questions, please contact us and also let us know how we can improve future guides.

Education Is The Key...

Manatee Viewing Areas

To See Manatees Living in the Wild:

Blue Spring State Park
Orange City, FL

(386) 775-3663

www.floridastateparks.org/bluespring/default.cfm

During the winter, usually November through March, manatees visit the warm waters of Blue Spring. The park also features a boardwalk and nature trail and has an excellent interpretive program during manatee season. Open year-round. Entry fee.

Tampa Electric Company, Manatee Viewing Center

Apollo Beach, FL

(813) 228-4289 for an information recording

www.manatee-teco.com (choose Manatees)

The outdoor observation areas at the Manatee Viewing Center offer the opportunity to observe manatees at a warm-water refuge in the winter. Open seasonally, December through March, daily 10:00 a.m. to 5:00 p.m. No entry fee.

Lee County Manatee Park

Ft. Myers, FL

(239) 694-3537

www.leeparks.org

(choose Parks, Regional Parks and then Manatee Park)

Manatees can be viewed at the Lee County Manatee Park in the

winter – usually November through March. Free, guided walks are also available. Open year-round. Parking fee.

Florida Power and Light Co.

Manatee Observation Center, Riviera Beach, FL

(800) 552-8440

www.fpl.com

(choose Our Environment and then Endangered Species)

The FPL plant is one of the warm-water gathering areas of manatees on Florida's east coast. Open seasonally from January 2 through February 28. No entry fee.

To See Manatees Living in Captivity in Florida:

Homosassa Springs Wildlife State Park

Homosassa, FL

(352) 628-5343

www.HomosassaSprings.org

Manatees at the park can be observed along the nature walks or from a special underwater room called "The Fish Bowl." A manatee interpretive center is also located at the park, and a manatee education program is offered daily. Open year-round. Entry fee.

SeaWorld Orlando

Orlando, FL

(407) 351-3600

www.seaworld.com (choose SeaWorld Orlando, Experiences & Attractions, Animal Attractions and then Manatee Rescue)

SeaWorld has a two-level manatee exhibit and is licensed to rescue and medically treat manatees. Ask for the Animal Lover's tour. You will be able to observe manatees in different stages of rehabilitation year-round. Entry fee.

The Living Seas at Epcot/Walt Disney World

Lake Buena Vista, FL

(407) 824-4321

www.disney.com (search for The Living Seas)

The Living Seas at Walt Disney World's Epcot Center features a two-level manatee exhibit where manatees can be observed year-round. Guests can also speak with an animal care staff member for more information on manatees. Entry fee.

Miami Seaquarium

Miami, FL

(305) 361-5705

<http://miamiseaquarium.com> (choose Attractions and then Presentations)

Miami Seaquarium has a manatee exhibit and is licensed by the U.S. Fish and Wildlife Service to rescue and medically treat manatees. An interpretive program is also available year-round. Entry fee.

Lowry Park Zoo

Tampa, FL

(813) 935-8552

www.lowryparkzoo.com (choose Zoo Attractions and then Animal Habitats)

Lowry Park Zoo has a manatee exhibit and is licensed to rescue and medically treat manatees. A self-guided program is available year-round. Guided tours are also available at group rates (a three-week notice is required). Entry fee.

To See Manatees Living in Captivity

Outside of Florida:

The Columbus Zoo and Aquarium

Powell, OH

(614) 645-3550

www.colszoo.org (choose Animal Areas, Shores, and then Manatee)

The Columbus Zoo features an exhibit called Manatee Coast where manatees can be observed year-round. Signage and interactive displays offer answers to frequently asked questions about manatees and their habitat. Entry fee.

Cincinnati Zoo and Botanical Gardens

Cincinnati, OH

(513) 281-4700

www.cincyzoo.org (choose Exhibits/Gardens, Animal Exhibits, and then Manatee Springs)

Manatees are housed at the Manatee Springs exhibit, which has an exhibit showing the biodiversity of Florida. The exhibit also has an underwater viewing area and an interactive manatee education display. Entry fee.

SeaWorld California

San Diego, CA 92109

(800) 25-SHAMU

www.seaworld.com (choose SeaWorld San Diego, Attractions & Events, Animal Attractions and then Manatee Rescue)

The Manatee Rescue attraction at SeaWorld California includes an underwater viewing gallery where manatees can be seen year-round. Entry fee.

Manatee Resources continued from page 6

Print Resources

Reference Materials

Domning, D. P. 1996. Bibliography and index of the sirenia and desmostylia. Smithsonian Institution Press, Washington, DC, 1996.

Hartman, D.S. 1979. Ecology and behavior of the manatee (*Trichechus manatus*) in Florida. *Amer. Soc. of Mammalogists Spec. Publ.*, No. 5. Lawrence, KS. 153 pp.

Humphrey, S.R. (Ed.). 1992. Rare and endangered biota of Florida. Volume I. Mammals. University Press of Florida, Gainesville, FL.

Knight, R.L., Gutzwiller, K.J. 1995. Wildlife and recreationists: Coexistence through management and research. Island Press, Washington, DC.

Kohm, K.A. (Ed.) 1991. Balancing on the brink of extinction: The endangered species act and lessons for the future. Island Press, Washington, DC.

Lefebvre, L.W., O'Shea, T.J. Rathbun, G.B., Guest, R.C. 1989. In: C.A. Woods (Ed.), *Biogeography of the West Indies: Past, present, and future*. Sandhill Crane Press, Gainesville, FL.

Noss, R.F., Peters, R.L. 1995. Endangered ecosystems: A status report on America's vanishing habitat and wildlife. *Defenders of Wildlife*. Washington, DC.

O'Shea, T.J. 1988. The past, present, and future of manatees in the southeastern United States: Realities, misunderstandings, and enigmas. In: R.R. Odom, K.A. Riddleberger, & J.C. Ozier (Eds.), *Proceedings of the Third Southeastern Nongame and Endangered Wildlife Symposium*. Georgia Dept. of Natural Resources, Game and Fish Division, Social Circle, GA. Pages 184–204.

Packard, J.M., Rathbun, G.B., Domning D.P. Best, R.C., Anderson, P.K., O'Shea, T.J. 1984. Sea cows and manatees. In: D.W. Macdonald (Ed.) *The encyclopedia of mammals*. Facts on File Publication, New York, NY. Pages 340–349.

Reynolds, J.E., Odell, D.K. 1991. Manatees and dugongs. *Facts On File, Inc.*, New York, NY.

Reynolds, J.E., Rommel, S.A. 1999. *Biology of marine mammals*. Smithsonian Institution Press, Washington, DC.

Ridgway, S.H., Harrison, R. (Eds.) 1985. *Handbook of marine mammals*. Volume 3. The sirenians and baleen whales. Academic Press, Inc., San Diego, CA.

Ripple, J., Perrine, D. 1999. Manatees and dugongs of the world. Voyageur Press, Stillwater, MN.*

Rohlf, D.J. 1989. The endangered species act: A guide to its protection and implementation. Stanford Environmental Law Society, Stanford, CA.

Twiss, J.R., Reeves, R.R. (Eds.) 1999. *Conservation and management of marine mammals*. Smithsonian Institution Press, Washington, DC.

Van Meter, V.B. 2001. *The West Indian manatee in Florida*. Florida Power and Light Co., Miami, FL.

**Available through Save the Manatee Club's catalog department.*

Scientific Papers

Ackerman, B.B., Wright, S.D., Bonde, R.K., Odell, D.K., Banowitz, D. 1995. Trends and patterns in mortality of manatees in Florida, 1974–1992. Pages 223–258 in O'Shea, T.J., Ackerman, B.B., Percival, H.F. (Eds.) *Population biology of the Florida manatee*. National Biological Service Information and Technology Report No. 1. Washington, DC. 289 pp.

Beck, C.A., Reid, J.P. 1995. An automated photo-identification catalog for studies of the life history of the Florida manatee. Pages 120–134 in O'Shea, T.J., Ackerman, B.B., Percival, H.F. (Eds.) *Population biology of the Florida manatee*. National Biological Service Information and Technology Report No. 1. Washington, DC. 289 pp.

Bonde, R.K. 1993. Manatees in Florida: A personal perspective. *Whalewatcher* (Jour. Amer.Cetacean Soc.), 27(1): 16–18.

Bonde, R.K., Beck, C.A. 1990. How the Florida manatees fare today. *Whalewatcher* (Jour. Amer.Cetacean Soc.), 24(1): 8–9.

Deutsch, C.J., Bonde, R.K., Reid, J.P. 1998. Radio-tracking manatees from land and space: Tag design, implementation, and lessons learned from long-term study. *Marine Technology Society Journal* 32 (1): 18–29.

Garrott, R.A., Ackerman, B.B., Cary, J.R., Heisey, D.M., Reynolds III, J.E., Rose, P.M., Wilcox, J.R. 1994. Trends in counts of Florida manatees at winter aggregation sites. *J. Wildl. Manage.* 58(4): 642-654.

Manatee Resources continued from page 5

Internet Resources

General Manatee Information:

The Brain of the Florida Manatee
www.manateebrain.org
Florida Fish and Wildlife Conservation Commission (FWCC), Bureau of Protected Species Mgmt (BPSM)
<http://myfwc.com/manatee>

Save the Manatee Club
www.savethemanatee.org
(choose Manatee Info and Cool Manatee Stuff)

SireNews
The Society For Marine Mammalogy
IUCN/SSC Sirenia Specialist Group
(A newsletter with information manatees and dugongs)
www.marinemammalogy.org/snews.htm

Smithsonian Institution
Manatee and Dugong Online Bibliography
www.si.edu/resource/faq/nmnh/sirenia.htm
U.S. Fish and Wildlife Service (USFWS)
West Indian Manatee Information
www.fws.gov/angered/ia0c.html

Manatee Mortality:

FWCC – Florida Wildlife Research Institute (FWRI)
www.floridamarine.org (choose Florida Manatee at left)

Manatee Research and Tracking:

FWCC – FWRI
Photo-Identification Program, Population Monitoring and Aerial Surveys, and Radiotelemetry and Tracking
www.floridamarine.org (choose Florida Manatee at left)

Satellite Tracking West Indian Manatees
www.wildtracks.org

U.S. Geological Survey, Sirenia Project
<http://cars.er.usgs.gov/Manatees/manatees.html>

Other Sirenian Species:

Great Barrier Reef Marine Park Authority, Dugong Site
www.gbrmpa.gov.au (search for Dugongs)

Career Information:

Strategies For Pursuing A Career In Marine Mammal Science
www.marinemammalogy.org/strat.htm

Endangered Species:

Endangered Species Coalition
www.stopextinction.org

USFWS – Endangered Species Program
<http://endangered.fws.gov>

Habitat:

Florida Department of Environmental Protection (DEP)
www.dep.state.fl.us

DEP's Florida Water Management Districts
www.dep.state.fl.us/secretary/watman

Hydrologic Information:

NASA Observatorium
<http://observe.atc.nasa.gov>
University of North Dakota
Hydrological Cycle
www.und.edu/instruct/eng/fkarnier/pages/cycle.htm

Print Resources

Books for Young Readers

Amato, C. Wenzel, D. 1997. Chessie, the meandering manatee. Barron's Educational Series, Inc., Hauppauge, NY.
Anderson, L.H. 2000. Manatee Blues. Pleasant Company Publications, Middleton, WI.
Arnosky, J. 2000. A manatee morning. Simon and Schuster, New York, NY.
Haley, J. 1996. J. Rooker, manatee. Focus Publishing, Inc., Bemidji, MN.*
Jacobs, F. 1979. Sam the sea cow, Walker and Company, New York, NY.*
Lithgow, J. 2003. I'm a manatee (book and CD). Simon & Schuster Children's Publishing, New York, NY.
Mäden, M. 1999. The great manatee rescue. Dog and Pony Publishing, Kill Devil Hills, NC.
National Geographic book of mammals. 1998. National Geographic Society, Washington, DC.
Richardson, A.D. 2003. Manatees: peaceful plant-eaters. Bridgestone Books, Mankato, MN.
Tate, S. 1990. Mary manatee, A tale of sea cows. Nags Head Art, Nags Head, NC.*

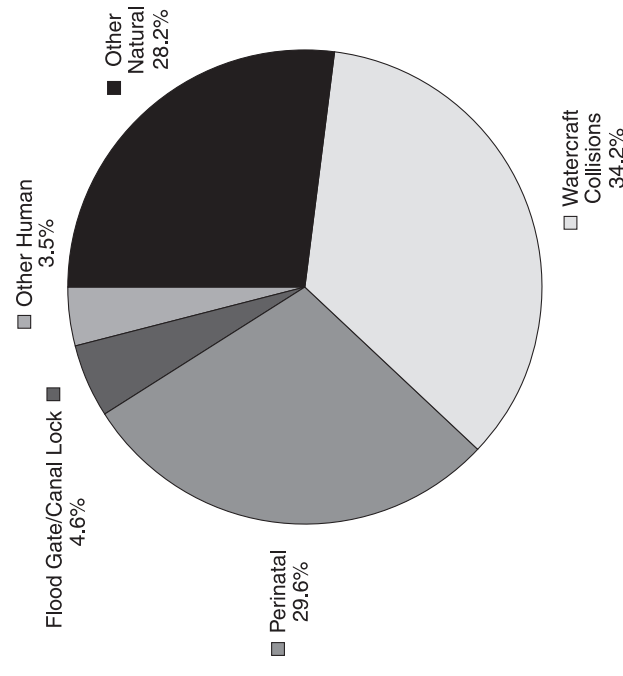
*Available through Save the Manatee Club's gift catalog department

continued on page 7

Manatee Mortality

Manatee Mortality in Florida 1974–2005

(where a cause of death can be determined*)



Note: Numbers are rounded, so they may not equal 100%.

Scientists break down the causes of manatee deaths into six different categories:

- **Watercraft Collisions:** Manatee mortalities caused by the crushing impact of the hull and/or slashing of the propellers. In the case of large power vessels and barges moving through shallow waters, manatees may be caught between the vessel and the water bottom, or the vessel and a docking structure, and crushed.
 - **Flood Gate or Canal Lock:** Manatee mortalities caused when the animal is crushed and/or drowned in these structures.
 - **Other Human-Related:** Manatee mortalities caused by monofilament line, fishing nets, fishing hooks, litter, poaching or other human activities.
 - **Perinatal:** A dependent calf less than 150 centimeters (about 5 feet) that died around the time of birth and was not determined to have died from human-related causes.
 - **Other Natural:** Mortalities caused by natural circumstances such as cold weather or disease.
 - **Undetermined:** The manatee is too badly decomposed to determine the cause of death, the necropsy finding is inclusive, or the manatee carcass was reported and verified but not recovered. (*Not depicted in above pie chart.)
- You can get current manatee mortality statistics from the Florida Fish and Wildlife Conservation Commission web site at: www.floridamarine.org.**

Synoptic Survey Information

For more information on aerial surveys and the current status of the manatee population, see page 17 of *Manatees: An Educator's Guide* and the Save the Manatee Club Web site at www.savethemanatee.org/population.htm.

Manatee Resources

Resources for Teachers

The following resources are available by contacting Save the Manatee Club:

Manatees: An Educator's Guide (6th Edition): This publication, first available in 1985, has recently been updated and includes information on the natural history, habitat and problems affecting the manatee in Florida. Research and conservation issues are also addressed. Educators may receive a free copy by sending their request on school letterhead with a self-addressed 9" x12" stamped envelope (postage is \$1.83). Accompanying this guide is a free poster, *Sirenians of the World*, depicting the West Indian manatee and four related species.

Manatees: A Coloring and Activity Book: Available for elementary educators. (For young students.) Produced by the Northeast Florida Regional Planning Council and Save the Manatee Club. Limit one per teacher but may be copied for students. Please specify that you want the coloring and activity book when you request the educator's guide (see above), and include \$2.07 in postage on the 9" x12" stamped envelope.

Teacher In-Services: Save the Manatee Club offers free in-service programs on the West Indian manatee to educators throughout Florida. In-services are available in one to two hour blocks and cover general description, physiology, behavior, communication, reproduction, habitat, range, food, related species, mortality/endangered status and ways to help protect manatees.

Adopt-A-Manatee Program: School groups or classes can adopt an endangered manatee for a special discounted rate of \$20.00 through Save the Manatee Club. The adoption includes a copy of *Manatees: An Educator's Guide* with the four-color poster *Sirenians of the World*, and a coloring and activity book. School groups will receive an adoption certificate, an underwater photo, a case history of the adopted manatee, and a membership handbook with other manatee information. In addition, classes and school groups will also receive the Club's quarterly newsletter, complete with adoption updates, education articles and information on manatee-related issues.

Paddle Tales, Free E-Newsletter: Each month, you'll get the scoop on current manatee news (plus great photos!), meet a manatee from our Adopt-A-Manatee program, discover fun games or activities, learn about special offers and events, and more. And, we'll answer your questions about manatees! Sign up online at www.savethemanatee.org/enews_signup.htm or e-mail education@savethemanatee.org and ask to be added to the list.

Audio-Visual Resources

Manatees: Species in Peril.* Available in VHS videotape. Approximately 45 minutes in length. Produced by Save the Manatee Club and International Video Projects, Inc., 6700 S. Florida Ave., Suite 28, Lakeland, FL 33813. 1-800-852-0662, www.videoprojects.tv. This tape has been distributed throughout the state, and Florida educators should check their district media centers or county libraries for availability. Out-of-state educators and other interested parties may purchase a video for \$17.95 from SMC. A DVD version is available for \$24.95.

Manatees: A Living Resource by J.E. Reynolds III. Available on VHS videotape or filmstrip. Educational Images Ltd., P.O. Box 3456, West Side Station, Elmira, NY 14905, 1-800-527-4264, www.educationalimages.com

Manatee Messages: What You Can Do! Produced by Save the Manatee Club (SMC). Available on VHS videotape in elementary or secondary level formats. Approximately 12 minutes in length. (Videotapes can be requested as open captioned for hearing-impaired students.) This tape has been distributed throughout the state, and Florida educators should check their district media centers or county libraries for availability. Out-of-state educators and other interested parties may purchase a video from SMC. Written permission may also be obtained to duplicate and/or broadcast the video by contacting SMC.

Saving a Species: The Manatee Story. Approximately 30 minutes in length. Available in VHS or DVD. Sea World San Diego. Call 1-800-25-SHAMU (then press 4), e-mail swc.education@seaworld.com or go to www.swbg-estore.com.

*Available through Save the Manatee Club's gift catalog department.

TOTAL MANATEE MORTALITY IN FLORIDA By Year and Cause 1974-2005

YEAR	1974	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000	2001	2002	2003	2004	2005	TOTAL
Watercraft Collisions	3	6	10	13	21	24	16	24	20	15	34	33	33	39	43	50	47	53	38	35	49	42	60	54	66	82	78	81	95	73	69	80	
Flood Gate/Canal Lock	0	1	4	6	9	8	8	2	3	7	3	3	3	3	5	7	3	3	9	5	16	8	10	8	9	15	8	1	5	3	3	5	
Other Human	2	1	0	5	1	9	2	4	1	5	1	5	1	3	1	2	4	5	4	6	6	5	5	0	8	8	9	7	4	8	8	144	
Perinatal	0	7	14	9	10	9	13	13	14	18	25	23	27	30	30	30	44	53	48	39	46	56	61	61	53	53	58	62	53	72	72	88	
Cold Stress	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	6	9	14	46	1	0	2	4	0	17	4	9	5	14	31	17	45	29
Natural	0	1	2	1	3	4	5	9	41	6	24	19	1	10	15	18	21	13	20	22	33	35	101	42	12	37	34	59	102	25	77	109	
Undetermined	2	13	32	80	40	23	19	64	35	30	41	38	45	22	25	40	41	39	46	36	40	55	166	65	76	69	69	108	67	78	54	109	
TOTAL	7	29	62	114	84	77	63	116	114	81	128	119	122	114	133	168	206	174	163	145	193	201	415	242	231	269	272	325	305	380	276	396	

* Note: "Perinatal" (Dependent Call) corresponds to the size class of the manatee recovered and is not a cause of death. "Undetermined" includes carcasses that were verified-not recovered, undetermined decomposed, and undetermined, and is not a cause of death. For the majority of manatees in the "Undetermined" category, the carcass was too decomposed to determine the cause of death.
Prepared By: Save the Manatee Club.
Prepared Using: 1974-2005 Manatee Mortality Data from the Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute.