GUIDELINES FOR MANATEE CONSERVATION

DURING

COMPREHENSIVE EVERGLADES RESTORATION PLAN

IMPLEMENTATION

Photograph courtesy of Sheri Etchemendy,
Florida Fish and Wildlife Conservation Commission

PREPARED BY

CERP INTERAGENCY MANATEE TASK FORCE

OCTOBER 2006

GUIDELINES FOR MANATEE CONSERVATION

DURING

COMPREHENSIVE EVERGLADES RESTORATION PLAN

IMPLEMENTATION

Prepared by

CERP Interagency Manatee Task Force

U.S. Fish and Wildlife Service
South Florida Ecological Services Office
Vero Beach, Florida

October 2006

Dedicated to David Ferrell, formerly with the Service's Field Office in Vero Beach and former chair of the CERP Interagency Manatee Task Force.

Thank you, Dave, for your relentless drive and leadership in attaining our goals as a team. We wish you and your family the best in retirement.

Table of Contents

I. Notice to Users

This document and maps pertain to the Central and Southern Florida Project (C&SF) as maintained by the South Florida Water Management District (SFWMD) and the U.S. Army Corps of Engineers (Corps). It does not include smaller local water control districts (i.e., Chapter 298 districts) or county maintained canals or structures.

This document and maps are tools meant to be used in the pre-application and planning processes regarding manatees and do not replace State and Federal permitting procedures. All activities should still adhere to permitting requirements and conditions. The maps provided are products of data gathered from many sources and are not to be used for any purpose other than informational. The document and maps are subject to constant revisions and updates without notice. To ensure that you have the most recent copies, please contact the U.S. Fish and Wildlife Service's (Service) Vero Beach Field Office (772-562-3909) to receive updates.

The accessibility of canals and structures as delineated on the enclosed maps and database are defined as follows:

Green = Accessible to manatees. This includes canals with structures that operate on an infrequent basis.
Red = Not accessible to manatees under standard operating procedures. This includes canals with structures that have break-away or removable barriers which are opened only for emergency conditions or maintenance procedures.
Orange = Conditionally accessible to manatees due to high water events.
Purple = Accessibility unknown.

This document makes no attempt to address the beneficial aspects of the Comprehensive Everglades Restoration Plan (CERP) on the continued health of Florida's manatees, which can only be fully assessed through long-term monitoring of the ecosystem responses brought about by the CERP. Rather, the recommendations contained in this document are intended to be integrated into CERP planning and decision-making with the goal of minimizing or avoiding manatee conflicts in the future.

II. Introduction

Timely information regarding manatee usage, abundance and ecological requirements is required by a variety of CERP planning partners to conserve manatees during CERP implementation, operation, and adaptive management. The CERP Interagency Manatee Task Force (Task Force) developed a set of guidelines to meet this need. The Task Force is including additional guidelines developed by or in development with the Florida Fish and Wildlife Conservation Commission (FWC). Under the auspices of the Florida Manatee Recovery and Implementation Team, the Task Force has the responsibility to provide management recommendations designed to avoid manatee/CERP conflicts and to facilitate beneficial actions in furtherance of species recovery.

The guidelines are designed to be used by planners, engineers, biologists, and other decision makers involved in the planning, design, and implementation of the CERP. Of particular importance is that the Corps and the SFWMD utilize this document as a tool to avoid potential conflicts between manatees and CERP during the planning, construction and operation of upcoming large water projects in the C&SF. This document was designed as a living document and will be modified and updated as necessary.

The endangered West Indian (Florida) manatee is protected under the Endangered Species Act (16 U.S.C. 1531 et seq.), the Marine Mammal Protection Act (16 U.S.C. 1361 et seq.), the Florida Endangered and Threatened Species Act of 1977 (Section 372.072 Florida Statutes) and the Florida Manatee Sanctuary Act (Section 370.12(2) Florida Statutes). These guidelines are consistent with and further the goals of these statutes.

III. Manatee Accessibility in the C&SF Project

The area boundaries presented below were created by the Task Force to organize field investigations and to aid in discussions. These boundaries are arbitrary and do not imply any agency, research, or ecological value.

A. Lake Okeechobee and Tributaries

This region of the C&SF encompasses the St. Lucie Canal, the Caloosahatchee River, the Kissimmee River north to Lake Kissimmee, and Lake Okeechobee and surrounding smaller canals.

Manatees enter and exit Lake Okeechobee from the east coast of Florida via the St. Lucie Canal (C-44) and from the west coast of Florida via the Caloosahatchee River (C-43). Numerous manatees are observed each year passing through the navigational locks in both waterways. Although sightings occur year-round depending on the temperature, it is generally believed that manatees migrate up these waterways from each coast in the spring and summer months (April to October) and return to the east and west coastal areas during the onset of the cold season (November to March). There are no known warm water sources in Lake Okeechobee. Water temperatures consistently drop below 20°C during the cold season in this system and which, depending on the duration and intensity of the decreased temperatures, may lead to cold stress and possibly mortality of manatees.

Using data from Aerial Distribution Surveys that are being conducted by the FWC Tequesta Field Laboratory, manatees appear to use this system throughout the year except when water temperatures drop below the 20°C threshold. Manatees are observed foraging and resting in the lake, the Rim Canal, and adjacent waterways and tributaries. Taylor Creek (Okeechobee County), the mouth of the Kissimmee River (C-38), and all of the Caloosahatchee River (C-43) provide preferred habitat for manatees when water temperatures are above 20°C. The Kissimmee River is accessible to manatees up to at least Lake Kissimmee. Manatee usage this far upriver, however, is considered rare. There has been one report of a manatee sighting in Lake Istokpoga.

B. Central and Southern Everglades

This region of the C&SF encompasses the Everglades Agricultural Area (EAA) southward to Florida Bay, including Everglades National Park and western Palm Beach, Broward and Miami-Dade counties.

Manatees are known to exit Lake Okeechobee through the lift gate structures (S-351, S-352, and S-354) located along the southern shore of the lake and enter the EAA where, because of differences in water levels, they become entrapped in the interconnecting system of canals. Other manatee access points into the Central and Southern Everglades are structures located in western Miami-Dade County. These structures include four banks of culverts, (S-337, S-31, S-32, and S-32A) at the intersection of the Miami Canal (C-6) and the L-30/L-33 Canals. There are also three structures (S-338, S-194, and S-196) that allow access into the C-111 and L-31N Canals.

Within the Central and Southern Everglades, the risk to entrapped manatees includes insufficient manatee forage, water temperatures below the survivability threshold for manatees, and secondary structure-related injury and mortality. It is the policy of FWC to rescue or attempt to rescue every manatee that is reported as entrapped within this system; however, rescues within the system are difficult and often impossible due to the deep and interconnected configuration of these canals. This difficulty has resulted in numerous documented single sightings, mortalities, and unknown dispositions of these manatees. The number of manatees in this system is believed to be underestimated due to the remoteness of this region.

Task Force members collected data pertaining to manatee habitat suitability in the C&SF. Data collection focused on manatee accessibility, mortalities and rescues, forage, temperature, canal configurations, refugia, structure type and abundance, boat ramps, and watercraft usage. A matrix was developed as a management tool to identify areas of risk to manatees during and after CERP implementation. Subsequent to an extensive evaluation, the Task Force recommended barriers be placed at ten structures to prevent manatee access into the majority of the EAA of the C&SF where risk is the highest for manatees to become entrapped and become susceptible to cold stress-related mortality. The SFWMD and the Corps have accepted this recommendation and planning for the barriers is underway for the three major structures (S-351, S-352 and S-354). This action will prevent the majority of manatee movement into the EAA and significantly decrease the occurrence of entrapment within this system (Cook, Penny; Liberta Scotto and Steve Mortellaro. *Interagency Manatee Task Force and Everglades Restoration.* GEER Conference; June 5-9, 2006; Lake Buena Vista, Florida.) The structures are expected to be installed in October 2006. The maps in this document reflect manatee accessibility after the placement of barriers at the S-351, S-352, and S-354 has been completed.

C. Southeast Florida

This region of the C&SF encompasses the coastal areas of Palm Beach, Broward and Miami-Dade counties.

Manatees have intermittent access through all structures that have a vertical lift gate or gated culvert of sufficient size to provide passage. Flow velocity is a limiting factor. Although the ability to navigate through flow is influenced by the size and health of the individual manatee, manatees have been observed navigating through flow up to 7 cubic feet per second (B. Tibbles, FPL, personal communication, 2003). Manatees are occasionally crushed or physically trapped in water control structures and locks themselves, although recent modifications of the operating procedures and use of sensors that prevent the structures from closing on objects has significantly reduced this threat. Therefore, most manatees have potential access to most of the canal systems in Southeast Florida.

Most of these canal systems do not pose a threat of trapping manatees in an isolated segment of the canal because of frequent gate openings which allow ingress and egress and the availability of suitable forage west of the coastal structures. However, there are some canals in which the frequency of the gate openings must be monitored when manatees are sighted west of the first coastal structure to avoid possible entrapment. Although most canals in this region are warmer than those in the Central and Southern Everglades and Lake Okeechobee regions, there is still a potential for cold stress to manatees that are unable to migrate to warm water refugia. This is especially true for juvenile and calf-aged manatees due to their greater susceptibility to cold stress.

Based on sighting, rescue, and mortality data, FWC has designated the following canals (listed from north to south) as a high risk of entrapment to manatees:

- C-12 canal beyond the S-33 due to infrequent gate openings;
- Military Canal beyond the S-20G due to infrequent gate openings;
- L-31E canal beyond the S-20 due to infrequent gate openings and lack of forage; and
- any canal in which an “over the top” weir structure allows infrequent access due to high water events.

Careful consideration must be given to any project implemented in this region that either alters manatee accessibility or adds new structures that may result in physical harm to or entrapment of manatees.

D. Southwest Florida

This region, although not considered part of the C&SF, was investigated for manatee accessibility and includes the primary canals of the SFWMD Southwest region, the I-75 canal east to the L-28 Interceptor canal, and Tamiami Canal east to the Turner River.

For the most part, inland accessibility in the southwest region stops at the first coastal structure. Some of these inland sites serve as warm water refugia as well as sources of drinking water. No significant sighting, mortality or rescue data exists in the regions east or north of these structures.

An exception to this area of limited inland access is the Tamiami Canal along the north side of U.S. 41, which is accessible to manatees at several locations along its length. Key entry points to the Tamiami Canal include the Turner River, S.R. 29 Canal, and the Baron River canal at Bridge

75. During most seasons, the S.R. 29 canal provides access to freshwater at Thunder Point, just north of U.S. 41. From the S.R. 29 canal, the Tamiami Canal runs east to a basin at Wooten's Airboat Tours where manatees aggregate with regularity during winter cold periods. Manatees are likewise able to travel under Bridge 75 (just west of S.R. 29) to the Tamiami Canal where several spur canals provide access to an extensive area to the north and west.

Other small passages under U.S. 41 to the Tamiami Canal may allow manatee access on occasion. Accessibility past some existing structures is possible during periods of high water. The Faka Union weir, adjacent to the high manatee-use area at Port of the Islands, is a noteworthy example of a structure with this opportunistic inland access possibility. Likewise, high water may enable manatees to enter the Tamiami Canal from the Big Cypress National Preserve headquarters canal. Manatees routinely aggregate during cold weather in the deep canals at the Big Cypress National Preserve headquarters. Some of the existing and newly installed culverts under U.S. 41 are being evaluated for manatee access, especially during high water.

IV. List of Contributors and Telephone Contact Information

CERP Manatee Task Force Members:

Member	Affiliation	Phone number
Kalani Cairns (Current Chair)	Service	(772) 562-3909 x 240
Ernie Clarke	Corps	(904) 232-1199
Christy Combs	SFWMD	(561) 682-2128
Penny Cook	FWC	(772) 260-6203
Kit Curtin	Independent research	(305) 453-3339
Susan Markley	Miami-Dade DERM	(305) 372-6863
Ron Mezich	FWC	(850) 922-4330
Steve Mortellaro	Service	(772) 562-3909 x 322
Jim Reid	USGS	(352) 372-2571
Liberta Scotto	Service	(772) 562-3909 x 312
Forrest Shaw	Miami-Dade DERM	(305) 372-6854
Larry Taylor	Corps	(904) 232-1911

Other individuals who contributed:

David Ferrell (Former Chair)	Retired	
Roger Congdon (data analysis)	Service	(702) 515-5230
Jeremy Crossland	Corps	(863) 983-8101
Janet Cushing	USGS	(703) 648-4093
Mary Duncan (FWC guidelines)	FWC	(850) 922-4330
Steve Glass (GIS analysis)	Service	(772) 562-3909 x 238
Tom Kosier	SFWMD	(561) 682-6533
Ryan Peck	formerly with the Corps	N/A
Kent Smith	FWC	(850) 922-4330
Skip Snow	ENP	(305) 252-6822
Brad Stith	USGS	(352) 372-2571
Trisha Stone	SFWMD	(561) 682-6954
Barry Wood (GIS analysis)	Service	(772) 562-3909 x 225

SFWMD Field Station personnel and Pump Station personnel contributed greatly in assisting with field investigations.

Research conducted by the FWC Tequesta Field Laboratory (aerial surveys, temperature probe studies, structure assessments, etc.) and a portion of the compilation of this document were funded by a grant through the Corps. This research continues until March 2007 when the final report on *Determining Accessibility of Florida Manatees to the Central and Southern Florida Canal Systems and Structures* will be produced. For a copy of this report, please contact Penny Cook or Kalani Cairns.

V. List of Additional Information Sources

The following is a list of additional sources for information from State and Federal agencies in Florida.

A. State Agencies

SOUTH FLORIDA WATER MANAGEMENT DISTRICT (SFWMD)
www.sfwmd.gov
(The information below was obtained from the SFWMD web site.)

Headquarters Location
3301 Gun Club Road
West Palm Beach, Florida 33406

Mailing Address
P.O. Box 24680
West Palm Beach, Florida 33416-4680
(561) 686-8800 or (800) 432-2045 (Florida Only)

SFWMD SERVICE CENTERS:

- Director of Service Centers - Humberto Alonso; (954) 713-3200
- Big Cypress Basin (Naples) - Clarence Tears, Basin Director; (239) 597-1505
- Broward - Bert Waters, Director; (954) 713-3200
- Florida Keys (Plantation Key) - Cecelia Weaver, Director; (305) 853-3219 or (800) 464-5067
- Lower West Coast (Fort Myers) - Rhonda Haag, Director; (239) 338-2929 or (800) 248-1201
- Martin/St. Lucie - Karen Smith, Director; (772) 223-2600 or (800) 250-4100
- Miami/Dade - Jose Fuentes, Director; (305) 377-7274 or (800) 250-4300
- Okeechobee - Benita Whalen, Director; (863) 462-5260 or (800) 250-4200
- Orlando - Tom Genovese, Director; (407) 858-6100 or (800) 250-4250
- Palm Beach County - Fred Rapach, Director; (561) 682-2283

SFWMD FIELD STATIONS:

- **Southwest Region,** Big Cypress Basin, (239) 597-1505
- **Clewiston Field Station**, (863) 983-1431
- **Fort Lauderdale Field Station**, (954) 452-4814
- **Homestead Field Station**, (305) 242-5933
- **Kissimmee Field Station** (407) 846-5226
- **Miami Field Station** (305) 513-3420
- **Okeechobee Field Station** (863) 462-5280 or (800) 250-4200
- **West Palm Beach Field Station** (561) 791-4100

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FWC)
www.myfwc.com
To Report INJURED, ENTRAPPED, OR DEAD MANATEES:
1-888-404-3922(FWCC)

Fish and Wildlife Research Institute
Tequesta Field Lab
19100 SE Federal Highway
Tequesta, Florida 33469
(561) 575-5408

Imperiled Species Management
620 South Meridian Street MS-6A
Tallahassee, Florida 32399-1600
(850) 922-4330

B. Federal Agencies

U.S. ARMY CORPS OF ENGINEERS
www.saj.usace.army.mil
Jacksonville District
701 San Marco Boulevard
Jacksonville, Florida 32207-8175
(904) 232-2235

U.S. FISH & WILDLIFE SERVICE
www.fws.gov/verobeach
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960
(772) 562-3909

North Florida Ecological Services Office
6620 Southpoint Drive South, Suite 310
Jacksonville, FL 32216-0958
(904) 232-2580

MARINE SPECIES OBSERVER EXPERIENCE REQUIREMENTS
Developed by and adopted from FWC, June 2006

Certain water-related construction, demolition, dredging, surveying, testing, or permitted marine events require a program that includes experienced observers to watch for and protect marine species (manatees, marine turtles, dolphins, and whales). Such experience includes field training under the direct supervision of an experienced observer, and repeated field observations dealing successfully with interactions with marine species during projects.

Procedure for Approval

If a person is interested in becoming approved for a particular project or would like to be listed in the wildlife agency's list of observers, a resume as well as a completed form called *Observer Experience and Education Documentation for Marine Species Watch Programs (June 2006)* should be sent to the following address: Florida Fish and Wildlife Conservation Commission, Imperiled Species Management Section, 620 South Meridian Street MS-6A, Tallahassee, Florida 32399-1600 or submitted at fcmpmail@myfwc.com.

If more than 10 years has lapsed since a person has had experience observing marine animals, they will be qualified for one level lower than the number of hours and number of sightings outlined in this guidance. Their watch level can be upgraded as they gain more recent observation experience.

Levels of Watch

Because some projects pose more of a risk to marine species than other projects, an observer's experience must be suited to the level of risk expected for a particular project. When a project's state or federal permit authorization requires observers, the wildlife agencies involved in the review of those permits typically must approve the observers on a project-by-project basis. A list of experienced observers is maintained to provide contractors with a list of possibly qualified individuals. Being identified on an agency's list does not automatically qualify an observer for a project. Individuals must still be approved on a project by project basis, based on their level of experience. This list will only be updated on an annual basis. A copy of the list can be found at: http://www.myfwc.com/manatee/permits/Observer.htm.

The following table provides guidance on acceptable levels of observer experience as it corresponds to types of projects. These criteria should be considered only guidance, and the wildlife agencies reserve the right to approve or disapprove observers for particular projects, listing, or level of watch experience as warranted.

Watch Levels	Type of Project	Experience Required	Notes
Level 1: Trainee	This observer does not fulfill a permit requirement as a sole, secondary, or lead watch observer for any type of project.	FWC recommends that trainees watch the "Manatee Observation Video," available from the FWC before performing field observation.	Trainees work as a second observer under the direct, onsite supervision of a Level 2 (or higher) observer. Observation experience is gained by on-the-job training, which is being performed to qualify as a Level 2 observer.
Level 2:	This observer may fulfill a permit requirement as a sole, secondary, or lead watch observer for water-related construction, dredging or demolition that is not located in an Important Manatee Area (IMA) and that does not involve blasting, boat races or movie production.	Must have obtained a minimum of 10 hours of observation time from a land or boat-based position and a minimum of five sightings of any type of marine mammal or marine turtle. Experience must have been performed under the direct, on-site supervision of a Level 3 (or higher) observer.	This observer may gain observation experience as a trainee to qualify as a Level 3 observer for other types of projects; however, they will not be qualified to fulfill a permit requirement on projects that involve IMAs, blasting, boat races, movie productions, or aerial surveys.
Level 3:	This observer may fulfill a permit requirement as a sole, secondary, or lead watch observer for water-related construction, dredging or demolition, including blasting projects, boat races or movie production, and including activities located in Important Manatee Areas (IMA).	Must have obtained a minimum of 20 hours of observation time from a land or boat-based position and a minimum of ten (10) sightings of any type of marine mammal or marine turtle. Experience must have been performed under the on-site supervision of a Level 4 Observer.	This observer may gain observation experience as a trainee to qualify as a Level 4 (aerial) observer for other types of projects; they may fulfill a permit requirement as a secondary observer or part of a watch team on projects that involve aerial surveys but are not qualified to perform as the aerial observer.
Level 4: Aerial	This observer fulfills a permit requirement as a sole, secondary or lead watch observer for any type of project.	Must have obtained a minimum of 30 hours of aerial observation and documentation of sightings of any type of marine mammal or marine turtle **on at least half** of their documented flights. Experience must have been performed under the on-site supervision of a Level 4 Observer.	This observer may fulfill a permit requirement as aerial observer on projects that require aerial surveys.

Glossary

Important Manatee Areas (IMAs) – Important Manatee Areas are those areas that have been identified in the Corps' Manatee Key (July 2005) as areas within certain counties where increased densities of manatees occur due to the proximity of warm water discharges, freshwater discharges, natural springs and other habitat features that are attractive to manatees. These areas are heavily utilized for feeding, transiting, mating, calving, nursing or resting as indicated by aerial survey data, mortality data and telemetry data. Copies of these maps can be found at: http://www.myfwc.com/manatee/permits/CorpMaps.htm

Lead Observer – The responsible party of a watch team is considered the supervisor of that team and responsible for the logistics of the watch. The Lead Observer coordinates watch activities before, during and after the water-related activity; recommends whether or not to continue the watch and/or project activity; and is responsible for all reporting requirements.

Level of Watch – A combination of observer hours and sightings resulting in different levels of watch qualification. The intent of assignment to a watch level is to match an observer's qualifications with the level of risk to a marine species from a particular water-related activity.

Observer Positions – Stationary or mobile platforms from which to observe marine species. Observer positions generally are ground, watercraft and/or aircraft-based; bridges and buildings may also be utilized for specific types of projects. The type, size and location of the water-related activity, as well as the species being observed, usually dictate the number and kind of observer positions. The highest position over water often is the best for detecting animals. Observer qualifications are based on time spent in the different positions as well as the number of observations recorded.

Qualified Observer – A qualified observer is a person that has provided adequate personal information and observation experience to the appropriate resource agencies in order to be approved for a specific project. Wildlife resource agencies determine the specific Level of Watch these observers are qualified to perform. Observation experience for marine species must include manatees, marine turtles, dolphins or whales.

Observer Experience and Education Documentation
for Marine Species Watch Programs
June 2006

Certain water-related construction, demolition, dredging, surveying, testing, or permitted marine events require a program that includes experienced observers to watch for and protect marine species (manatees, marine turtles, dolphins, and whales). Such experience includes field training under the direct supervision of an experienced observer, and repeated field observations dealing successfully with interactions with marine species during projects.

In order to be approved as an observer for a specific project, or to be added to a list of experienced observers maintained by both State and Federal resource agencies, this form should be filled out and returned to the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street MS-6A, Tallahassee, Florida 32399-1600 or emailed to fcmpmail@myfwc.com.

This list of experienced observers is only maintained to provide contractors with a list of possibly qualified individuals. Being identified on an agency's list does not automatically qualify an observer for project. Individuals must still be approved as appropriate on a project by project basis, based on their level of experience. The list will only be updated on an annual basis.

Observer Contact Information			
Name and Address	Company Name and Address	Phone number and cell phone number	Email Address

Education		
Degree/Major	Institution	Year
1.		
2.		

Experience				
1. Name of Project/Permit Number	Description of Project Work or Location	Number of hours spent observing	Number/type of marine animals sighted	Name and contact information for supervising/training observer
	Position in watch (land-based, boat-based, air, etc.)		Actions taken	

2. Name of Project/Permit Number	Description of Project Work/Location	Number of hours spent observing	Number/type of marine animals sighted	Name and contact information for supervising/training observer
	Position in watch (land-based, boat-based, air, etc.)		Actions taken	
3. Name of Project/Permit Number	Description of Project Work/Location	Number of hours spent observing	Number/type of marine animals sighted	Name and contact information for supervising/training observer
	Position in watch (land-based, boat-based, air, etc.)		Actions taken	
4. Name of Project/Permit Number	Description of Project Work/Location	Number of hours spent observing	Number/type of marine animals sighted	Name and contact information for supervising/training observer
	Position in watch (land-based, boat-based, air, etc.)		Actions taken	
Training				
Please provide details concerning any specific training or training materials completed (such as the NMFS training, or viewing the FWC observation video):				
Observer Signature			**Date**	

STANDARD MANATEE CONSTRUCTION CONDITIONS
Developed by and adopted from FWC, July 2005

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-232-2580) for north Florida or Vero Beach (1-561-562-3909) for south Florida.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 feet by 4 feet which reads *Caution: Manatee Area* must be posted. A second sign measuring at least 81/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities.

FWC-Approved Manatee Educational Sign Suppliers

ASAP Signs & Designs
624-B Pinellas Street
Clearwater, FL 33756
Phone: (727) 443-4878
Fax: (727) 442-7573

Vital Signs
104615 Overseas Highway
Key Largo, FL 33037
Phone: (305) 451-5133
Fax: (305) 451-5163

Wilderness Graphics, Inc.
P.O. Box 1635
Tallahassee, FL 32302
Phone: (850) 224-6414
Fax: (850) 561-3943
www.wildernessgraphics.com

Universal Signs & Accessories
2912 Orange Avenue
Ft. Pierce, FL 34947
Phone: (800) 432-0331
or (772) 461-0665
Fax: (772) 461-0669

Cape Coral Signs & Designs
1311 Del Prado Boulevard
Cape Coral, FL 33990
Phone: (239) 772-9992
Fax: (239) 772-3848

New City Signs
1829 28th Street North
St. Petersburg, FL 33713
Phone: (727) 323-7897
Fax: (727) 323-1897

Municipal Supply & Sign Co.
1095 Fifth Avenue, North
P.O. Box 1765
Naples, FL 33939-1765
Phone: (800) 329-5366
or (239) 262-4639
Fax: (239) 262-4645
www.municipalsigns.com

United Rentals Highway Technologies
309 Angle Road
Ft. Pierce, FL 34947
Phone: (772) 489-8772
or (800) 489-8758 (FL only)
Fax: (772) 489-8757

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work all in-water activities must

SHUT DOWN

Report any collision or injury to:

1-888-404-FWCC (1-888-404-3922)

Florida Fish and Wildlife Conservation Commission

GUIDELINES TO MINIMIZE/AVOID MANATEE ENTRAPMENT

PRE-CONSTRUCTION

Water control structures, trash rakes, barriers and other devices that may entrap manatees (even temporarily) within a closed waterway could result in harm or death to the entrapped manatee. At least 90 days prior to installing a structure that may be a barrier or impediment to manatee movement, advanced consultation with the Service and the FWC should occur. When a manatee-accessible waterway is proposed to be closed to manatees (exclusion area), aerial and ground surveys are required to ensure that manatees are not entrapped in a closed system.

1. Aerial Survey: Prior to installing the last section of any barriers (temporary or permanent) that could result in the entrapment of manatees within the waterway, SFWMD or the Corps shall conduct an aerial survey of the proposed exclusion area. The extent of the survey area will be identified by the Service and FWC. Both the Service and FWC should be contacted to participate in the aerial survey. It is recommended that the surveys be conducted by helicopter.

2. Waterway Closure: If no manatees are sighted within the exclusion area, the waterway will be closed off immediately following the survey. If manatees are sighted within the exclusion area, they should be observed to see if they move beyond the proposed barrier. If they do not move out of the waterway within 10 days, the Corps and SFWMD shall consult with the Service and FWC to determine if the barrier should be put in place. Manatees shall not be herded, poked, prodded or harassed in any way to move them along the waterway.

POST-CONSTRUCTION

Once the barrier has been installed, the barrier and waterway should be monitored by land once daily for a period of one week to check for the presence of manatees. If manatees are sighted within the exclusion area, the FWC should be contacted at 888-404-FWCC.

GUIDELINES FOR CULVERTS LOCATED IN MANATEE-ACCESSIBLE CERP PROJECTS

The following guidelines are developed to prevent manatee entrapment within culverts and to exclude manatees from unsuitable habitat. The guidance below applies only to free-flowing culverts that are within areas regularly accessible to manatees. Structures with water control features (e.g., gates, flaps, etc.) and culverts that exceed the specifications below will require FWC and Service review.

NEW AND EXISTING CULVERTS

1. Size requirements: All culverts 8 inches to 8 feet in diameter must be grated to prevent manatee entrapment. Grates must be spaced a maximum of 8 inches apart to effectively prevent manatee access. Diagonal, horizontal or vertical grates may be installed. Grates must be a permanent fixture and not part of a water control structure.

   Culverts less than 8 inches in diameter are exempt from this requirement, whereas, culverts greater than 8 inches may be subject to a case-by-case review, if necessary.

2. Length requirements: Based on documented manatee movement by FWC, the maximum recommended culvert length is 200 feet. Proposed culverts greater than 200 feet in length require consultation with the Service and FWC.

3. Case-by-Case Review: In consultation with the Service and FWC, all culverts may be reviewed. The decision to exclude manatees will be based on culvert length, water level, available habitat and other risk factors. If a decision is made to exclude manatees from access to culverts, the culvert should be grated, as described above.

   The benefit of access to important habitat (forage resources, calving sites, freshwater, travel corridors, warm-water refugia, refuge from watercraft or other forms of harassment) will be weighed against the potential risk of injury or death to manatees if the culvert were to remain accessible.

4. Additional Guidance:

   - Box culverts are preferred by the Service and FWC over round culverts. Bridges are the most preferred by the Service and FWC.

   - Manatees can become stranded in culverts during periods of low tide. Therefore, when planning for new culverts in tidal waters, a minimum 3-foot depth of water in the culvert at low tide stage is recommended.

THERMAL GUIDELINES IN MANATEE-ACCESSIBLE WATERS

AQUIFER STORAGE AND RECOVERY (ASR)

Implement the following during the winter season, typically between November 1 to March 31,:

1. ASR discharge water temperatures shall be monitored at both the discharge point and at selected sites in the receiving waters on a daily basis until the effect of the discharge has been determined.

2. Intermittent ASR discharges that increase receiving water ambient temperature above 20˚C may create unreliable warm-water refugia, which will not sustain manatees through cold periods. These types of discharges should be modified to either:

    - Impound or store water to decrease temperatures equal to or below ambient water temperature prior to discharge, or

    - Diffuse or mix ASR waters to dilute temperature effects so no temperature increase occurs in ambient waters, or

    - Ensure that ASR water released into ambient waters is a minimum of 20˚C prior to discharge, and that the volume of flow is continuous and sufficient to provide warm-water refugia that will be biologically meaningful to manatees.

REDISTRIBUTION OF FRESHWATER FLOWS (WARM WATER REFUGES)

Agencies implementing CERP projects should monitor and adaptively manage the effects of freshwater flow redistribution on manatees. Among these effects are anticipated shifts in manatee distribution, movement patterns, and foraging areas. Manatees are known to be adversely affected from prolonged exposure to water temperatures below 20˚C. Therefore, CERP-related changes that may affect manatee winter-use patterns deserve close attention.

A large number of manatees over-winter at passive thermal refuges within the CERP project areas. These locations provide slightly warmer waters where manatees aggregate during winter cold spells. Of particular interest are changes in physical characteristics of these sites due to CERP projects that affect changes in water flows.

Documented manatee warm-water refuges within CERP project areas shall be assessed for anticipated changes prior to construction activities. The Task Force and associated agencies may provide guidance and recommendations on preconstruction actions to minimize detrimental effects.

The Task Force and associated agencies will assist with developing protocols to avoid/minimize adverse effects to manatees during CERP construction activities.

Sites identified as likely to be affected by the redistribution of freshwater flows shall be monitored for fluctuations in water temperature and manatee use.

If water temperatures in documented refugia are lowered below 20°C due to the introduction of CERP redistributed flows, alternative technologies (e.g., solar arrays) shall be employed to sufficiently warm the water above 20°C in order to protect any affected refugia.