Homeland Security

Environmental Planning and Historic Preservation
Decision Support System

Sarasota Powerboat Grand Prix - Project Approved

Status

- In Preparation (08/20/2024)
- Environmental Review (08/20/2024)
- Senior Environmental Review (08/20/2024)
- Proponent Review (08/22/2024)
- Project Approved (08/22/2024)

Project Information

General

Name: Sarasota Powerboat Grand Prix
DSS ID: DSS-USCG-2024-20399
Security: Unclassified
Description: Sarasota Powerboat Grand Prix. Recurring Marine Event. 9/13/2024 - 9/15/2024. Marine Event Permit for high-speed boat race. Gulf of Mexico Racecourse, off of Sarasota.

Funded through IRA?: No
Funded through the IIJA?: No
Critical Infrastructure?: No
Adopting Another Agency Catex, or CATEX Determination?: No
Project Type: Administrative & Regulatory Activities - Approvals of regatta and marine parade event permits for the following events: Events that are located in, proximate to, or above an area designated as environmentally sensitive by an environmental agency of the Federal, state, or local government and for which the USCG determines, based on consultation with the Governmental agency, that the event will not significantly affect the environmentally sensitive area. (CATEX *L63b)
Existing EA/EIS?: No
Requires EA/EIS?: No
Project Priority: Normal
Federal Assistance: No
Type of Permit: Marine Event Permit
Estimated Project Cost: (not entered)

Component

Component: USCG - U.S. Coast Guard
Region/Area/Unit: USCG Civil Engineering Unit – Miami Fl

Dates

FY Funding: 2024
Proposed Project Start: 09/13/2024
Proposed Project End: 09/15/2024
Review Start: 08/19/2024

Project Location

- U.S. Territorial Water: North East - N27 20.232 W82 35.968 N.WEST N27 19.092 W82 37.462 S.WEST N27 17.244 W82 35.113 S.EAST N27 17.829 W82 34.095

Team

- Document Preparer, Zachary VanLier, zachary.i.vanlier@uscg.mil
- Environmental Reviewer, Mara Brown (Level I), mara.j.brown@uscg.mil
- Senior Environmental Reviewer, Mara Brown (Level I), mara.j.brown@uscg.mil
- Proponent, Michael Kahle, michael.p.kahle@uscg.mil

Categorical Exclusions

- L63(b)* - Approvals of regatta and marine parade event permits for the following events:

Events that are located in, proximate to, or above an area designated as environmentally sensitive by an environmental agency of the Federal, state, or local government and for which the USCG determines, based on consultation with the Governmental agency, that the event will not significantly affect the environmentally sensitive area.

Required Conditions

1. Any change to the Proposed Action that may cause a physical interaction with the human environment will require re-evaluation for compliance with NEPA and other EP&HP requirements before the action can proceed.
2. This review addresses NEPA and other EP&HP requirements as described in DHS Directive 023-01. This review may identify the need for additional federal, state, and/or local permits, approvals, etc. required for the Proposed Action. However, this review may not satisfy those requirements and the Proponent is responsible for ensuring that all other appropriate federal, state, and/or local permits, approvals, etc. have been obtained.

Decision Documents

- Record of Environmental Consideration (REC), 12.29kB

Attachments

- NMFS Programmatic Agreement, 3.86MB

Comments

- There are no comments.

EPHP Review

Environmental Resources

- Is the Proposed Action a piece of a larger action or connected to another action? -- No
  Please explain how you came to this determination. : Annual recurring event. The event will be a permitted event.
- Will the Proposed Action have a potentially significant effect on public health or safety? Areas to consider include, but are not limited to: environmental justice considerations; air quality; noise impacts; hazardous wastes and/or contamination; wastewater; potable water; and changes in modes or safety of transportation. -- No
  Explain how the proposed action would not have a potentially significant effect on public health or safety. : The 2-day grand prix event will occur during daylight hours and the sponsors and participants will abide by their environmental watch plan.
- Would the proposed action place a disproportionately high and adverse human health or environmental effect on minority populations and low-income populations? -- No
- Will the Proposed Action have a potentially significant effect on species or habitats protected by the Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, or Magnuson-Stevens Fishery Conservation and Management Act? -- No
  Provide a conclusion under which statute the determination was made (e.g., no effect, NLAA, LAA, for ESA, etc.), how the determination was made, why it is considered significant, and copies of any consultation (informal and/or formal). : This will be a USCG permit issued event. The sponsors will abide by all recommendations from FWC and NMFS programmatics and follow their watch plan.
  Attachments: FWS, NMFS, or Wildlife Agency Consultation: (No files uploaded yet.)
- What is your Endangered Species Act (ESA) finding and determination? -- No effect
  Explain how the determination was made (e.g., are species present in the area but your proposed action will have no effect? why?). Although not required, recommend attaching any consultation or correspondence conducted.: Sponsors will follow their watch plan and will have observers during the event.
  Attachments: ESA consultation: Watch Plan (WATCH PLAN- Sarasota 2024.pdf, 297.18kB)
- What is your Marine Mammal Protection Act (MMPA) finding and determination? -- No effect or negligible effect
  Explain how the determination was made (e.g., are species present in the area but your proposed action will have no effect or negligible effects? why?). Although not required, recommend attaching

any consultation or correspondence conducted.: Watch plan will be utilized and observers will be present during the event.
Attachments: MMPA consultation: (No files uploaded yet.)

- Would the proposed action adversely affect a species protected under the Bald and Golden Eagle Protection Act or Migratory Bird Treaty Act or habitat for such species? -- No
  Explain how the determination was made (e.g., are species present in the area but your proposed action will have no adverse effect or no significant effect? why?). Although not required, recommend attaching any consultation or correspondence conducted.: No adverse effects.
  Attachments: BGEPA MBTA consultation: (No files uploaded yet.)
- What is your Magnuson-Stevens Fishery Conservation and Management Act (essential fish habitat) finding and determination? -- No effect
  Attachments: EFH consultation: (No files uploaded yet.)
- Will the Proposed Action have a potentially significant effect on an environmentally sensitive area? Examples include, but are not limited to: areas having special designation or recognition such as prime or unique agricultural lands, coastal zones, designated wilderness study areas, wild and scenic rivers, 100-year floodplains, wetlands, sole source aquifers, Marine Sanctuaries, National Wildlife Refuges, National Parks, National Monuments, etc. -- No
- Special Flood Hazard Area (i.e. floodplains) -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
- Jurisdictional wetlands and Other Waters of the U.S. -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
- Coastal Barrier Unit -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present
- Coastal Zone Management Area -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present
- Section 10 navigable waterway -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
- Sole Source Aquifers and Wellheads -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
- Prime Farmland -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.

- Designated land (i.e., Wilderness Area, Wild and Scenic River, Marine Sanctuary, National Park, National Monument, National Natural Landmark, Wildlife Refuge, and Wilderness Area -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
- Will the Proposed Action result in the potential violation of a Federal, State, or local law or requirement imposed to protect the environment? -- No
  Please summarize determination. : This event will not violate Federal, State, or local law requirements.
- Will the Proposed Action have an effect on the quality of the human environment that is likely to be highly controversial in terms of scientific validity, likely to be highly uncertain, or likely to involve unique or unknown environmental risks? -- No
  Required: Please explain. : Event occurs offshore
- Will the Proposed Action employ new or unproven technology that is likely to involve unique or unknown environmental risks, where the effect on the human environment is likely to be highly uncertain, or where the effect on the human environment is likely to be highly controversial in terms of scientific validity? -- No
  Required: Please explain.: No new or unproven technology will be utilized.
- Will the Proposed Action establish a precedent for future actions that have significant effects? -- No
  Please explain how you came to this determination. : The event will not establish a precedent for future actions
- Is the Proposed Action significantly greater in scope or size than normally experienced for its particular category of action? -- No
  Required: Please summarize determination.: The event is not greater in scope or size.
- Will the Proposed Action have the potential to result in the significant degradation of existing poor environmental conditions? Will the Proposed Action initiate a potentially significant environmentally degrading influence, activity, or effect in areas not already significantly modified from their natural condition? -- No
  Please explain how you came to this determination. : The event will not result in significant degradation of existing poor environmental conditions.
- Is the Proposed Action related to other actions with individually insignificant but cumulatively significant impacts? -- No
  Please explain how you came to this determination. : Non-related to other actions.
- Are there any other requirements for the protection of the environment that need to be considered for this proposed action? -- No

Historic Preservation & Cultural Resources

- Is the Proposed Action a piece of a larger action or connected to another action? -- No
  Please explain how you came to this determination. : Annual recurring event. The event will be a permitted event.

- Will the Proposed Action have a potentially significant effect on public health or safety? Areas to consider include, but are not limited to: environmental justice considerations; air quality; noise impacts; hazardous wastes and/or contamination; wastewater; potable water; and changes in modes or safety of transportation. -- No
  Explain how the proposed action would not have a potentially significant effect on public health or safety. : The 2-day grand prix event will occur during daylight hours and the sponsors and participants will abide by their environmental watch plan.
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- Will the Proposed Action have a potentially significant effect on species or habitats protected by the Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, or Magnuson-Stevens Fishery Conservation and Management Act? -- No
  Provide a conclusion under which statute the determination was made (e.g., no effect, NLAA, LAA, for ESA, etc.), how the determination was made, why it is considered significant, and copies of any consultation (informal and/or formal). : This will be a USCG permit issued event. The sponsors will abide by all recommendations from FWC and NMFS programmatics and follow their watch plan.
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  Attachments: ESA consultation: Watch Plan (WATCH PLAN- Sarasota 2024.pdf, 297.18kB)
- What is your Marine Mammal Protection Act (MMPA) finding and determination? -- No effect or negligible effect
  Explain how the determination was made (e.g., are species present in the area but your proposed action will have no effect or negligible effects? why?). Although not required, recommend attaching any consultation or correspondence conducted.: Watch plan will be utilized and observers will be present during the event.
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  Explain how the determination was made (e.g., are species present in the area but your proposed action will have no adverse effect or no significant effect? why?). Although not required, recommend attaching any consultation or correspondence conducted.: No adverse effects.
  Attachments: BGEPA MBTA consultation: (No files uploaded yet.)

- What is your Magnuson-Stevens Fishery Conservation and Management Act (essential fish habitat) finding and determination? -- No effect
  Attachments: EFH consultation: (No files uploaded yet.)
- Will the Proposed Action have a potentially significant effect on an environmentally sensitive area? Examples include, but are not limited to: areas having special designation or recognition such as prime or unique agricultural lands, coastal zones, designated wilderness study areas, wild and scenic rivers, 100-year floodplains, wetlands, sole source aquifers, Marine Sanctuaries, National Wildlife Refuges, National Parks, National Monuments, etc. -- No
- Special Flood Hazard Area (i.e. floodplains) -- N/A
  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
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  Explain why this resource is not applicable to your proposed action (e.g. is your proposed action located entirely within a building and no resources are present?): No resources present.
- Will the Proposed Action result in the potential violation of a Federal, State, or local law or requirement imposed to protect the environment? -- No
  Please summarize determination. : This event will not violate Federal, State, or local law requirements.

- Will the Proposed Action have an effect on the quality of the human environment that is likely to be highly controversial in terms of scientific validity, likely to be highly uncertain, or likely to involve unique or unknown environmental risks? -- No
  Required: Please explain. : Event occurs offshore
- Will the Proposed Action employ new or unproven technology that is likely to involve unique or unknown environmental risks, where the effect on the human environment is likely to be highly uncertain, or where the effect on the human environment is likely to be highly controversial in terms of scientific validity? -- No
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  Required: Please summarize determination.: The event is not greater in scope or size.
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  Please explain how you came to this determination. : The event will not result in significant degradation of existing poor environmental conditions.
- Is the Proposed Action related to other actions with individually insignificant but cumulatively significant impacts? -- No
  Please explain how you came to this determination. : Non-related to other actions.
- Are there any other requirements for the protection of the environment that need to be considered for this proposed action? -- No
- Will the proposed action have a potentially significant effect on a district, highway, structure, or object that is listed, or eligible for listing, on the National Register of Historic Places, a historic or cultural resource, traditional or sacred site, or result in the destruction of a significant scientific, cultural, or historic resource? -- No
  Attachments: HR - Consultation: (No files uploaded yet.)
- What is the National Historic Preservation Act Section 106 effect determination? -- No effect
  Please explain how you came to this determination. : No historic sites/structures will be present during this event.
  Attachments: Section 106 consultation: (No files uploaded yet.)
- Does the proposed action limit access to, and ceremonial use of, Indian sacred sites on federal lands, by Indian religious practitioners, and/or adversely affect the physical integrity of such sites. -- No

DHS Record of Environmental Consideration (REC) for Categorically Excluded Actions under NEPA

INTRODUCTION

The purpose of this Record of Environmental Consideration (REC) is to provide a record that the potential for impacts to the quality of the human environment has been considered in the decision to implement the Proposed Action described below, in accordance with the National Environmental Policy Act of 1969 (NEPA) and DHS Directive 023-01 and Instruction Manual 023-01-001-01 on implementation of NEPA. DHS integrates the NEPA process with review and compliance requirements under other Federal laws, regulations, Executive Orders, and other requirements for the stewardship and protection of the human environment, as reflected in Section II (8) of this REC. Signature of the DHS Proponent on this REC demonstrates that they have considered the potential for impacts to the human environment in their decision to implement the Proposed Action as required by NEPA, and are committing to any conditions listed in Section IV of this REC that may be required for implementation of the project. When completed, the form is to be signed by the Preparer, the Environmental Approver, and the Action Proponent. The completed REC becomes a part of the administrative record for the Proposed Action.

SECTION I - Description of Proposed Action

1. Name of Component Authorizing the Proposed Action:

U.S. Coast Guard USCG Civil Engineering Unit – Miami Fl

2. Title of Proposed Action:

Sarasota Powerboat Grand Prix

3. Identifying Number of Proposed Action:

DSS-USCG-2024-20399

4. Estimated Start Date and Useful Life of Proposed Action:

Start Date: 09/13/2024 - End Date: 9/15/202

5. Location of Proposed Action:

U.S. Territorial Water: North East - N27 20.232 W82 35.968 N.WEST N27 19.092 W82 37.462 S.WEST N27 17.244 W82 35.113 S.EAST N27 17.829 W82 34.095

6. Description of Proposed Action:

Sarasota Powerboat Grand Prix. Recurring Marine Event. 9/13/2024 - 9/15/2024. Marine Event Permit for high-speed boat race. Gulf of Mexico Racecourse, off of Sarasota.

SECTION II - Analysis of Extraordinary Circumstances

7. ☒ Proposed Action is not a piece of a larger action

☐ Proposed Action is a piece of a larger action

Remarks:

8. For A through K, check the appropriate box and provide an explanation when appropriate. Include a summary of any coordination or consultation that occurred with a resource or regulatory agency, if relevant.

☐ Yes ☒ No — A. Will the Proposed Action have a potentially significant effect on public health or safety?

Remarks:

☐ Yes	☒ No	B. Will the Proposed Action have a potentially significant effect on species or habitats protected by the Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, or Magnuson-Stevens Fishery Conservation and Management Act?
Remarks:		
☐ Yes	☒ No	C. Will the Proposed Action have a potentially significant effect on a district, highway, structure, or object that is listed or eligible for listing on the National Register of Historic Places (NRHP)? Will the Proposed Action have a potentially significant effect on a historic or cultural resource, traditionalor sacred site, or result in the destruction of a significant scientific, cultural, or historic resource?
Remarks:		
☐ Yes	☒ No	D. Will the Proposed Action have a potentially significant effect on an environmentally sensitive area?
Remarks:		
☐ Yes	☒ No	E. Will the Proposed Action result in the potential violation of a Federal, State, or local law or requirement imposed to protect the environment?
Remarks:		
☐ Yes	☒ No	F. Will the Proposed Action have an effect on the quality of the human environment that is likely to be highly controversial in terms of scientific validity, likely to be highly uncertain, or likely to involve unique or unknown environmental risks?
Remarks:		
☐ Yes	☒ No	G. Will the Proposed Action employ new or unproven technology that is likely to involve unique or unknown environmental risks, where the effect on the human environment is likely to be highly uncertain, or where the effect on the human environment is likely to be highly controversial in terms of scientific validity?
Remarks:		
☐ Yes	☒ No	H. Will the Proposed Action establish a precedent for future actions that have significant effects?
Remarks:		
☐ Yes	☒ No	I. Is the Proposed Action significantly greater in scope or size than normally experienced for its particular category of action?
Remarks:		
☐ Yes	☒ No	J. Does the Proposed Action have the potential to result in significant degradation of existing poor environmental conditions? Will the Proposed Action initiate a potentially significant environmentally degrading influence, activity, or effect in areas not significantly modified from their natural condition?
Remarks:		
☐ Yes	☒ No	K. Is the Proposed Action related to other actions with individually insignificant but cumulatively significant impacts?
Remarks:		

SECTION III - Categorical Exclusion (CATEX) Determination

9. This action is not expected to result in any significant adverse environmental impacts as described in the National Environmental Policy Act of 1969 (NEPA). The proposed action has been thoroughly reviewed by the U.S. Coast Guard and it has been determined, by the undersigned, that this action is categorically excluded under current DHS CATEX **L63(b)*** from further environmental documentation, in accordance with Section 3 of DHS Directive 023-01, Environmental Planning Program since implementation of this action:

I. Clearly fits within one or more of the categories of excludable actions listed in Appendix A of DHS Instruction 023-01-001-01;
II. Is not a piece of a larger action which has been segmented into smaller parts in order to avoid a more extensive evaluation of the potential for significant environmental impacts;
III. Does not involve any extraordinary circumstances, as defined in DHS Instruction 023-01-001-01, Section V(B)(2), that would create the potential for a normally excluded action to have a significant environmental effect.

SECTION IV - Conditions

10. The following conditions are required to implement the Proposed Action:

☒Any change to the Proposed Action that may cause a physical interaction with the human environment will require re-evaluation for compliance with NEPA and other EP&HP requirements before the action can proceed.

☒This review addresses NEPA and other EP&HP requirements as described in DHS Directive 023-01. This review may identify the need for additional federal, state, and/or local permits, approvals, etc. required for the Proposed Action. However, this review may not satisfy those requirements and the Proponent is responsible for ensuring that all other appropriate federal, state, and/or local permits, approvals, etc. have been obtained.

SECTION V - Signatures

11a. Preparer of this REC

Name: Zachary VanLier	Digitally signed by Zachary VanLier at 08/20/2024 11:14 AM Zachary VanLier	Date: 08/20/2024

11b. Environmental Approver of this REC

Name: Mara Brown (Level I)	Digitally signed by Mara Brown (Level I) at 08/20/2024 1:04 PM Mara Brown (Level I)	Date: 08/20/2024

11c. Action Proponent

Name: Michael Kahle	Digitally signed by Michael Kahle at 08/22/2024 1:32 PM Michael Kahle	Date: 08/22/2024

Preview of Attachments

The following pages will display this project's attachments that are of these file types:

- .jpg /.jpeg
- .png
- .gif
- .txt
- .pdf

The attachments of compatible file types from this project are:

- NMFS Programmatic Agreement (NMFSBO2002.pdf)

Note:

All project attachments can be downloaded at the 'File Upload/Manage Attachments' page.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX 570-5517
http://caldera.sero.nmfs.gov

FEB - 7 2002 F/SER3:BH:mdh

Captain M.J. Kerski
Commander, Group Miami
United States Coast Guard
U.S. Department of Transportation
100 Mc Arthur Causeway
Miami Beach, FL 33139

Dear Captain Kerski:

This document represents the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) based on our review of the Marine Event Permitting Program as prosecuted by the U.S. Coast Guard (USCG) Groups Miami and Mayport and its effects on loggerhead turtles (*Caretta caretta*), Kemp's ridley turtles (*Lepidochelys kempii*), green turtles *(Chelonia mydas)*, leatherback turtles *(Dermochelys coriacea)*, and hawksbill turtles (*Eretmochelys imbricata*). This Opinion has been prepared in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1536 *et seq.*). The NMFS consultation number for this action is F/SER/2000/01051. If you have any questions about this consultation, please refer to this number.

This Opinion is based on information provided in letters from USCG Groups Miami and Mayport, phone conversations between NMFS staff and USCG staff, published and unpublished scientific information on the biology and ecology of threatened and endangered turtles and marine mammals within the action area, and other sources of information. A complete administrative record of this consultation is on file at the NMFS Southeast Regional Office in St. Petersburg, Florida.

The Opinion states NMFS' belief that the continued operation of the USCG Group Mayport and Group Miami's Marine Event Permitting Program is not likely to jeopardize the continued existence of loggerhead, Kemp's ridley, green, leatherback, or hawksbill sea turtles. However, NMFS anticipates incidental take of these species and has issued an Incidental Take Statement (ITS) pursuant to section 7 of the ESA. This ITS contains reasonable and prudent measures with implementing terms and conditions to help minimize this take.

Incidental takes of marine mammals are not authorized. If the USCG believes such takes may occur, an incidental take authorization under Marine Mammal Protection Act, Section 101 (a)(5),

ENCLOSURE (2)

is necessary. In this regard, please contact Ken Hollingshead of our headquarters Protected Resources staff at (301) 713-2055.

Sincerely,

For, Joseph E. Powers, Ph.D.
Acting Regional Administrator

Enclosure

cc: F/PR3

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX 570-5517
http://caldera.sero.nmfs.gov

CHRON

FEB -7 2002 F/SER3:BH:mdh

Commander J. E. Rendon
Commander, Group Mayport
United States Coast Guard
U.S. Department of Transportation
4200 Ocean Street
Mayport, FL 32233

Dear Commander Rendon:

This document represents the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) based on our review of the Marine Event Permitting Program as prosecuted by the U.S. Coast Guard (USCG) Groups Miami and Mayport and its effects on loggerhead turtles (*Caretta caretta*), Kemp's ridley turtles (*Lepidochelys kempii*), green turtles *(Chelonia mydas)*, leatherback turtles (*Dermochelys coriacea*), and hawksbill turtles (*Eretmochelys imbricata*). This Opinion has been prepared in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1536 *et seq*.). The NMFS consultation number for this action is F/SER/2000/01051. If you have any questions about this consultation, please refer to this number.

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Sincerely,

for, Joseph E. Powers, Ph.D.
Acting Regional Administrator

Enclosure

cc: F/PR3

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Endangered Species Act - Section 7 Consultation
Biological Opinion

Action Agency: United States Coast Guard, Groups Miami and Mayport

Activity: Marine Event Permitting (Consultation No. F/SER/2000/01051)

Consulting Agency: National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida

Approved By: for Joseph E. Powers, Ph.D., Acting Regional Administrator

Date Issued: FEB 7 2002

This document represents the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) based on our review of the Marine Event Permitting Program as prosecuted by the U.S. Coast Guard (USCG) Groups Miami and Mayport and its effects on loggerhead turtles (*Caretta caretta*), Kemp's ridley turtles (*Lepidochelys kempii*), green turtles *(Chelonia mydas),* leatherback turtles (*Dermochelys coriacea*), and hawksbill turtles (*Eretmochelys imbricata*). This Opinion has been prepared in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1536 *et seq*.). This Opinion is based on information provided in letters from USCG Groups Miami and Mayport, phone conversations between NMFS staff and USCG staff, published and unpublished scientific information on the biology and ecology of threatened and endangered turtles and marine mammals within the action area, and other sources of information. A complete administrative record of this consultation is on file at the NMFS Southeast Regional Office (SERO) in St. Petersburg, Florida.

Consultation History

Since 1997, NMFS has been commenting on marine event applications from various USCG groups. NMFS' responses on events that included the use of power boats recommended guidelines that the USCG could include in their permit for the activity to help protect sea turtles during the event. However, NMFS' responses could not conclude that sea turtles would not be harmed as a result of the activity. NMFS recommended ESA formal section 7 consultation for events that had the possibility of affecting sea turtles.

NMFS received a letter dated July 28, 2000, from USCG Group Mayport requesting formal ESA section 7 consultation on their Marine Events Permitting Program. NMFS received a letter from USCG Group Miami dated December 29, 2000, also requesting formal ESA section 7 consultation on their marine events permitting program. The boundaries of these groups' jurisdictions are a contiguous area from Sapelo Sound, Georgia, to Key West, Florida; therefore, NMFS has decided to combine these two consultation requests. In various phone conversations, NMFS SERO Protected Resources Division personnel requested additional information from USCG personnel in both groups. All information requested by NMFS from both groups was received on May 4, 2001. NMFS considers the additional information and the information received in the July 28, 2000, and December 29, 2000, letters to be a complete section 7 initiation package.

BIOLOGICAL OPINION

I. Description of Proposed Action

The USCG proposes to permit numerous marine events in Federal and state waters from Sapelo Sound, Georgia, to Key West, Flordia, over the next five years. These events include offshore fishing tournaments, sail boat regattas, boat parades, fireworks displays, various rowing races, and high speed boat races.

Offshore fishing tournaments target pelagic species such as dolphin and marlin. There will be approximately 25 offshore fishing tournaments permitted in the action area in any given year, with an estimated 3,000 vessels participating, ranging in length from 15 feet to greater than 60 feet. The USCG issues guidelines intended to help protect sea turtles as part of each permit issued for offshore fishing events. These guidelines include the following:

1. Do not cast your line where sea turtles are surfacing to breath.
2. If you hook or entangle a sea turtle on your line, gently bring the turtle close to you; use a dip net or firmly hold the front flippers and shell to safely lift out of the water.
3. Cut the line close to the hook and remove line that has become entangled around the turtle. Avoid the turtle's mouth and flipper claws; use blunt scissors/knife to cut line.
4. Do not lift the turtle above the water by pulling the line (this will result in further injury). If the distance to your boat from the water is too large to bring the turtle onboard safely, cut the line as short as possible to release the turtle.
5. Turtles with serious cuts and/or ingested or deeply embedded hooks need veterinary care. Retrieve the turtle as in guideline 2, keep the turtle in the shade, and immediately contact your local wildlife agency.

The USCG expects to permit approximately 60 boat parades, fireworks displays, sailing regattas, and rowing events (mostly kayaks) per year in the action area. Approximately 10,000 participant and spectator vessels will take part in these events. These events are slow moving and are not expected to harm protected species; therefore, the USCG does not issue special guidelines for protected species with its permits for these types of events.

The USCG expects to permit between 5-10 high speed events in the action area per year. These events have between 35-150 participating vessels and between 200-7,500 spectator vessels, per event. Because the use of high speed vessels has been shown to harm protected species, the USCG does not permit these events from November through March (these are times when humpback and right whales can be found in the action area), and issues manatee and sea turtle guidelines as part of any marine event permit issued for a high speed marine event. These guidelines have been developed by the U.S. Fish and Wildlife Service (USFWS) and NMFS and include the following:

Manatee Guidelines

1. To minimize the potential impact of this type of event on manatees, a continuous Manatee Watch Program will be established.

2. Prior to the event, race officials will provide a list of dedicated observers for the manatee watch to the USCG, USFWS, and the Florida Fish and Wildlife Conservation Commission (FFWCC) Bureau of Protected Species Management. This list must be submitted within one week of the scheduled event for approval. Either agency may disqualify a prospective observer if that person is not expected to adequately perform the duties required.

3. A formal manatee watch coordination meeting will be held prior to the day of the event. All race officials and racers shall attend a pre-race meeting (to be held the day of the race) and will be informed about the possible presence of manatees in the area, and that civil or criminal penalties can result from harassment, injury, and/or death of an endangered species. The danger of hitting a manatee should be emphasized to racers and bystanders.

4. A continuous aerial survey via helicopter shall be conducted beginning one hour prior to the event, and prior to any organized practice sessions, to identify any manatees in the vicinity of the event site. The survey will continue until all official and spectator vessels have cleared the area. Aerial surveys shall extend a minimum of one mile from the perimeter of the event site.

5. The manatee watch will consist of a minimum of four dedicated observers: one primary observer and three additional observers. The primary observer should be experienced in the observation of manatees at these types of events, and should be positioned at the highest vantage point possible. Other observer surveys will be conducted from elevated water or land based positions. Each observer will be equipped with two-way radio, binoculars, polarized sunglasses, and a chart of the race course and vicinity. The manatee watch observers will be dedicated exclusively to the manatee watch.

6. Observers will follow the protocol established for the "Manatee Watch Program" and will conduct the watch in good faith and to the best of their ability. The race organizers and the vessel operators will assume any liability for a violation of these protective measures involved in any collision with animals.

7. The observers will be in close communications with sponsors/officials to halt the event if a manatee(s) is/are spotted within the boundaries of the event or within 500 feet of the perimeter of the event site. The event shall not resume until the animal(s) moves away from the area under its own volition. Manatees must not be herded away or harassed into leaving. If the manatee(s) is/are not sighted a second time, the event will not resume until 30 minutes after the initial sighting.

8. If, in the opinion of the manatee watch observer, survey conditions are poor or deteriorate and become poor so as not to allow for proper sighting of animals in the race course area

(*i.e.*, numerous white caps and streaks created by high winds, lack of daylight), the event shall be immediately halted. If survey conditions improve to allow for proper sighting of animals, the event may resume.

9. All participants and official boats shall adhere to speed zones adjacent to the event site.

10. Within 30 days after completion of the event, the primary observer shall submit a report to the USCG and the USFWS. This report should include information regarding the event (such as weather, whether the event was canceled, *etc.*), and should verify the names of the observers and their positions during the event as those approved before the race. This report should include the number and location of manatees sighted, the circumstances in which the sighting occurred (which observer and position), and any problems encountered during the event, along with their possible solutions.

11. The event shall be immediately canceled if any one of these conditions is not met prior to or during the race. Any manatee watch observer or USCG representative shall have the authority to terminate the event as required above. Failure to adhere to these protective measures may result in recommendations to the USCG to not permit future events or to require bond to be posted to assure compliance to these conditions.

Sea Turtle Guidelines

1. The applicant and the USCG will coordinate with the USFWS and the appropriate state agencies to ensure that, during sea turtle nesting season, marked and unmarked sea turtle nests are not adversely impacted by spectators or event activities on the beach.

2. The applicant will thoroughly survey the racecourse for one hour prior to any racing activity to ensure there are no turtles on or within 100 yards of the course. Personnel aboard watercraft and/or "spotter" aircraft must conduct surveys. Aerial or waterborne spotters must not be assigned other duties that could detract from their ability to keep proper lookout.

3. The applicant will ensure that a thorough survey is conducted between the beach and 100 yards past the seaward perimeter of the racecourse to ensure that no sea turtles are in the area before starting the race.

4. If a turtle is spotted on or within 100 yards of the racecourse during the race, the applicant must take whatever steps are necessary to ensure that a collision with the animal is avoided. The applicant will ensure that all race participants and safety boats are aware of their obligation to stop the race immediately if a sea turtle strays onto or dangerously near the course.

5. The applicant will thoroughly survey the racecourse for one hour immediately after any racing activity to ensure that any turtles that may have been inadvertently struck and injured or killed can be cared for or disposed of by proper federally permitted authorities. Plans should be made for such an eventuality. Any turtle deaths or injuries must be reported by the next working day to the NMFS Protected Resources Division at (727)

570-5312.

6. Any other race-event activities (shakedown runs, preliminary heats, qualifying heats, demonstrations, *etc.*) that could harass or threaten the safety of sea turtles are subject to the same precautions described above.

Action Area

All state and Federal waters from Sapelo Sound, Georgia, to Key West, Florida.

II. Status of Listed Species and Critical Habitat

The following listed species under the jurisdiction of NMFS are known to occur in or near the action area:

Endangered

Blue whale	*Balaenoptera musculus*
Humpback whale	*Megaptera novaeangliae*
Fin whale	*Balaenoptera physalus*
Northern right whale	*Eubalaena glacialis*
Sei whale	*Balaenoptera borealis*
Sperm whale	*Physeter macrocephalus*
Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp's ridley sea turtle	*Lepidochelys kempii*
Green sea turtle	*Chelonia mydas**
Shortnose sturgeon	*Acipenser brevirostrum*

*Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

Threatened

Loggerhead sea turtle	*Caretta caretta*
Johnson's seagrass	*Halophila johnsonii*

Critical Habitat

Northern right whale	*Eubalaena glacialis*
Johnson's seagrass	*Halophila johnsonii*

Species of large whales protected by the ESA can be affected by high speed power boat activities; however, NMFS does not believe they are likely to be adversely affected by other activities such as fishing tournaments, activities that entail the use of sailboats or man powered vessels (kayaks), and slow moving boat parades and fireworks displays. All of the power boat races will take place relatively close to shore (1 to 5 miles offshore) and are, therefore, not likely to adversely affect blue, fin, sei, and sperm whales which are not expected to be found nearshore. Northern right whales and humpback whales are coastal animals and have been sighted in the Florida nearshore environment from November through March. However, power boat races will not be scheduled between those times and therefore are not likely to adversely affect these species. Based on this information, the chances of the proposed action affecting species of large whales protected by the ESA is discountable and will not be discussed further in this Opinion.

Designated northern right whale critical habitat (50 FR 28793) can be found in the action area from the mouth of the Altamaha River, Georgia, to Jacksonville, Florida, out 15 nautical miles (nm) and from Jacksonville, Florida, to Sebastian Inlet, Florida, out 5 nm. Marine events permitted by the USCG will not alter the physical and biological features (water depth, water temperature, and the distribution of right whale cow/calf pairs in relation to the distance from the shoreline to the 40-m isobath [Kraus *et al.* 1993]) that were the basis for determining this habitat to be critical. Therefore, northern right whale critical habitat is not expected to be adversely modified by marine events permitted by the USCG and will not be discussed further in this Opinion.

The Altamaha River, Satilla River, Saint Marys River, and the Saint Johns River can be found in the vicinity of action area. Records indicate that all of these rivers may have populations of shortnose sturgeon. Shortnose sturgeon stay mainly in their natal river or the river's estuary at or near the bottom and their populations in these areas are relatively small. Based on this information, the chances of a shortnose sturgeon entering an area where a permitted marine event is taking place and then coming in contact with a vessel is discountable. Therefore, shortnose sturgeon are not likely to be adversely affected by the proposed action and will not be discussed further in this Opinion.

Marine events with vessels that sit low enough in the water to affect Johnson's seagrass will take place in water deep enough to accommodate the draft of the vessel; therefore, Johnson's seagrass and Johnson's seagrass critical habitat are not likely to be adversely affected by the proposed action and will not be discussed further in this Opinion.

Kemp's Ridley Turtle (*Lepidochelys kempii*)

Of the seven extant species of sea turtles in the world, the Kemp's ridley has declined to the lowest population level. The Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (USFWS and NMFS 1992b) contains a description of the natural history, taxonomy, and distribution of the Kemp's ridley turtle. Kemp's ridleys nest in daytime aggregations known as arribadas, primarily at Rancho Nuevo, a stretch of beach in Mexico. Most of the population of adult females nest in this single locality (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963). By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid-1980s. Recent observations of increased nesting suggest that the decline in the ridley population has stopped and there is cautious optimism that the population is now increasing.

The nearshore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile Kemp's ridley and loggerhead sea turtles. Ogren (1988) suggests that the Gulf coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico. Stomach contents of Kemp's ridleys along the lower Texas coast consisted of a predominance of nearshore crabs and mollusks, as well as fish, shrimp and other foods considered to be shrimp fishery discards (Shaver 1991). Analyses of stomach contents from sea turtles stranded on upper Texas beaches apparently suggest similar nearshore foraging behavior (Plotkin pers. comm.).

Research being conducted by Texas A&M University has resulted in the intentional live-capture of hundreds of Kemp's ridleys at Sabine Pass and the entrance to Galveston Bay. Between 1989 and 1993, 50 of the Kemp's ridleys captured were tracked (using satellite and radio telemetry) by biologists with the NMFS Galveston Laboratory. The tracking study was designed to characterize sea turtle habitat and to identify small and large scale migration patterns. Preliminary analysis of the data collected during these studies suggests that subadult Kemp's ridleys stay in shallow, warm, nearshore waters in the northern Gulf of Mexico until cooling waters force them offshore or south along the Florida coast (Renaud, NMFS Galveston Laboratory, pers. comm.).

In recent years, unprecedented numbers of Kemp's ridley carcasses have been reported from Texas and Louisiana beaches during periods of high levels of shrimping effort. NMFS established a team of population biologists, sea turtle scientists, and managers, known as the Turtle Expert Working Group (TEWG), to conduct a status assessment of sea turtle populations. Analyses conducted by the group have indicated that the Kemp's ridley population is in the early stages of recovery; however, strandings in some years have increased at rates higher than the rate of increase in the Kemp's population (TEWG 1998). While many of the stranded turtles observed in recent years in Texas and Louisiana are believed to have been incidentally taken in the shrimp fishery, other sources of mortality exist in these waters. These stranding events illustrate the vulnerability of Kemp's ridley and loggerhead turtles to the impacts of human activities in nearshore Gulf of Mexico waters.

The TEWG (1998) developed a population model to evaluate trends in the Kemp's ridley population through the application of empirical data and life history parameter estimates chosen by the TEWG. Model results identified three trends in benthic immature Kemp's ridleys. Benthic immatures are those turtles that are not yet reproductively mature but have recruited to feed in the nearshore benthic environment, where they are available to nearshore mortality sources that often result in strandings. Benthic immature ridleys are estimated to be 2-9 years of age and 20-60 cm in length. Increased production of hatchlings from the nesting beach beginning in 1966 resulted in an increase in benthic ridleys that leveled off in the late 1970s. A second period of increase followed by leveling occurred between 1978 and 1989 as hatchling production was further enhanced by the cooperative program between the USFWS and Mexico's Instituto Nacional de Pesca to increase the nest protection and relocation program in 1978. A third period of steady increase, which has not leveled off to date, has occurred since 1990 and appears to be due to the greatly increased hatchling production and an apparent increase in survival rates of immature turtles beginning in 1990, due in part to the introduction of turtle excluder devices (TEDs). Adult ridley numbers have now grown from a low of approximately 1,050 adults producing 702 nests in 1985, to greater than 3,000 adults producing 1,940 nests in 1995, to greater than 9,000 adults producing about 5,700 nests in 2000.

The TEWG (1998) was unable to estimate the total population size and current mortality rates for the Kemp's ridley population. However, the TEWG listed a number of preliminary conclusions. The TEWG indicated that the Kemp's ridley population appears to be in the early stage of exponential expansion. Over the period 1987 to 1995, the rate of increase in the annual number of nests accelerated in a trend that would continue with enhanced hatchling production and the use of TEDs. Nesting data indicated that the number of adults declined from a population that produced 6,000 nests in 1966 to a population that produced 924 nests in 1978 and a low of 702 nests in 1985. Thus, the trajectory of adult abundance tracks trends in nest abundance from an estimate of 9,600 in 1966 to 1,050 in 1985. The TEWG estimated that in 1995 there were 3,000 adult ridleys. The increased recruitment of new adults is illustrated in the proportion of neophyte, or first time nesters, which has increased from 6% to 28% from 1981 to 1989 and from 23% to 41% from 1990 to 1994. The population model in the TEWG projected that Kemp's ridleys could reach the intermediate recovery goal identified in the Recovery Plan of 10,000 nesters by the year 2020 if the assumptions of age to sexual maturity and age specific survivorship rates plugged into their model are correct. It determined that the data reviewed suggested that adult Kemp's ridley turtles were restricted somewhat to the Gulf of Mexico in shallow nearshore waters, and benthic immature turtles of 20-60 cm straight line carapace length are found in nea.shore coastal waters including estuaries of the Gulf of Mexico and the Atlantic.

The TEWG (2000) identified an average Kemp's ridley population growth rate of 11.3% per year (95% C.I.. slope = 0.096-0.130) since 1985. Increase in hatchling production from 1985-1998 was slightly less, 9.5% per year. The 1996 and 1997 nest numbers reflected a slower rate of growth, while the increase in the 1998 nesting level was much higher, then decreased in 1999, and increased again strongly in 2000. The population growth rate does not appear as steady as originally forecasted by the TEWG, but annual fluctuations, due in part to irregular remigration intervals, are normal for other sea turtle populations. Given 2.5 nests per female, if the population continues to grow at 9.6%-13% per year, it is projected to reach the target of 10,000 nesting females around 2014-2025 (TEWG 2000).

The area surveyed for ridley nests in Mexico was expanded in 1990 due to degradation of the primary nesting beach by Hurricane Gilbert. The TEWG (1998) assumed that the increased nesting observed, particularly since 1990, was a true increase, rather than the result of expanded beach coverage. Because systematic surveys of the adjacent beaches were not conducted prior to 1990, there is no way to determine what proportion of the nesting increase documented since that time is due to the increased survey effort rather than an expanding ridley nesting range. The annual rate of increase of nests at Ranch Nuevo, only from 1985-1999, is 7.9% per year. It is uncertain whether the current rate of increase will continue. As noted by TEWG, trends in Kemp's ridley nesting even on the Rancho Nuevo beaches alone suggest that recovery of this population has begun but continued caution is necessary to ensure recovery and to meet the goals identified in the Kemp's Ridley Recovery Plan (TEWG 2000).

Loggerhead Turtle *(Caretta caretta)*

Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans and are the most abundant species of sea turtle occurring in U.S. waters. Loggerhead sea turtles concentrate their nesting in the north and south temperate zones and subtropics, but generally avoid nesting in tropical areas of Central America, northern South America, and the Old World (Magnuson *et al.,* 1990). The two largest known nesting aggregations of loggerhead sea turtles occurs on Masirah and Kuria Muria Islands in Oman and the aggregation of nesting loggerheads occurring in the southeastern United States. The loggerhead nesting aggregation on Masirah Island is estimated at a minimum of 30,000 nesting females each year. This is the only large nesting colony of loggerheads in Oman and is the largest known aggregation of this species in the world (Ross and Barwani 1982).

In the western Atlantic, most loggerhead sea turtles nest from North Carolina to Florida and along the Gulf coast of Florida. The Turtle Expert Working Group (1998, 2000) recognized at least four genetically distinct loggerhead nesting subpopulations in the western North Atlantic and southeastern United States and suggested that they be considered independent demographically, consistent with the definition of a distinct vertebrate population segment (59 FR 65884-65885, December 21, 1994; 61 FR 4722-4725 February 7, 1996) and of a management unit (NMFS SEFSC 2001, Part I). A fifth subpopulation was identified in NMFS SEFSC 2001. Although NMFS has not completed the administrative processes necessary to formally recognize populations or subpopulations of loggerhead sea turtles, these sea turtles are generally grouped by their nesting locations. This is also consistent with recovery criteria which are separated state by state. Based on the most recent reviews of the best scientific data on the population genetics of loggerhead sea turtles and analyses of their population trends (TEWG 1998, 2000; NMFS SEFSC 2001, Part I), NMFS treats these genetically distinct loggerhead turtle nesting aggregations as distinct subpopulations whose survival and recovery is critical to the survival and recovery of the species.

The subpopulations are divided geographically as follows: (1) a northern nesting subpopulation, occurring from North Carolina to northeast Florida at about 29° N (approximately 7,500 nests in 1998); (2) a south Florida nesting subpopulation, occurring from 29° N on the east coast to Sarasota on the west coast (approximately 83,400 nests in 1998); (3) a Florida Panhandle nesting subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City, Florida (approximately 1,200 nests in 1998); (4) a Yucatán nesting subpopulation, occurring on the eastern Yucatán Peninsula, Mexico (Márquez 1990) (approximately 1,000 nests in 1998) (TEWG 2000, Table 11); and (5) a Dry Tortugas nesting subpopulation, occurring in the islands of the Dry Tortugas, near Key West, Florida (approximately 200 nests per year) (NMFS SEFSC 2001, Part I).

The importance of maintaining these subpopulations in the wild is shown by the many examples of extirpated nesting assemblages in the world. Natal homing to the nesting beach provides the genetic barrier between these subpopulations, preventing recolonization with turtles from other nesting beaches. Recent fine-scale analysis of mtDNA work from Florida rookeries indicates that population separations begin to appear between nesting beaches separated by more than 100 km of coastline that does not host nesting (Francisco *et al.*, 2000); and tagging studies are consistent with this result (Richardson 1982, Ehrhart 1979, LeBuff 1990, CMTTP). Nest site relocations greater than 100 km occur, but generally are rare (Ehrhart 1979; LeBuff 1974, 1990; CMTTP; Bjorndal *et al.*, 1983).

The loggerhead sea turtles in the action area are likely to represent differing proportions of these five western North Atlantic subpopulations, as well as unidentified subpopulations from the eastern Atlantic. This Opinion considers these subpopulations for the analysis, with particular emphasis on the northern subpopulation of loggerhead sea turtles. The continental shelf areas of the U.S. Atlantic and Gulf of Mexico include foraging habitat for benthic animals. Although the northern subpopulation produces about 9% of the loggerhead nests, it comprises more of the loggerhead sea turtles found in foraging areas from the northeastern United States to Georgia. Between 24% and 46% of the loggerhead sea turtles in this area are from the northern subpopulation (NMFS SEFSC 2001; Bass *et al.*, 1999, 1998; Norrgard, 1995; Rankin-Baransky, 1997; Sears 1994, Sears *et al.*, 1995). In the Carolinas, the northern subpopulation is estimated to make up from 25% to 28% of the loggerheads (NMFS SEFSC 2001; Bass *et al.*, 1999, 1998). About 10% of the loggerhead sea turtles in foraging areas off the Atlantic coast of central Florida are from the northern subpopulation (Witzell *et al.*, in review). In the Gulf of Mexico, most of the loggerhead sea turtles in foraging areas are from the South Florida subpopulation, although the northern subpopulation may represent about 10% of the loggerhead sea turtles in the western gulf (Bass *et al.*, 1999).

Loggerheads reported captured in the pelagic longline fishery in the open ocean are mostly pelagic juveniles, although the size range does overlap pelagic stages with small benthic juveniles. (NMFS SEFSC 2001). Recent studies have suggested that not all loggerhead sea turtles follow the model of circumnavigating the North Atlantic Gyre as pelagic immatures, followed by permanent settlement into benthic environments. Some may not totally circumnavigate the north Atlantic. Some of these turtles may either remain in the pelagic habitat in the north Atlantic longer than hypothesized or they may move back and forth between pelagic and coastal habitats (Witzell in prep.). Laurent *et al.* (1998) proposed that between the strict oceanic pelagic stage and the benthic stages, immature turtles may live through an immature coastal stage in which they switch between pelagic and benthic foods and habitats. Also, some animals in the open ocean are probably adults, as they are known to make migrations between foraging grounds and nesting beaches across open ocean waters and benthic juveniles have been reported to migrate well offshore seasonally (Epperly *et al.*, 1995, Shoop and Kenney 1992, Mullin and Hoggard 2000).

In the Mediterranean Sea, about 45%-47% of the pelagic loggerheads are from the western Atlantic subpopulations, including 2% from the northern subpopulation, while the remainder originated from the Mediterranean nesting beaches (Laurent *et al.*, 1998). In the vicinity of the Azores and Madeira Archipelagoes, about 17%-19% of the pelagic loggerheads are from the northern subpopulation, about 71%-72% are from the South Florida subpopulation, and about 10%-11% are from the Yucatán subpopulation (Bolten *et al.*, 1998). The turtles from the Azores samples were dipnetted from the ocean's surface and represent a mixture of pelagic animals. The SEFSC report notes that these animals are smaller than those taken on pelagic longlines; although, if there is no sorting in the pelagic environment based on natal origin then these smaller animals still represent the same genetic mix that might be found in the larger animals. Consequently, these results can be applied to animals caught by the U.S. longline fleet in the North Atlantic, *i.e,* 19% of turtles taken would be expected to be from the northern subpopulation.

Loggerhead sea turtles originating from the western Atlantic nesting aggregations are believed to lead a pelagic existence in the North Atlantic Gyre for as long as 7-12 years. However, as noted above, studies have suggested that some of these turtles may either remain in the pelagic habitat in the north Atlantic longer than hypothesized or they may move back and forth between pelagic and coastal habitats (Witzell in prep.). Turtles in this life history stage are called "pelagic immatures" and are best known from the eastern Atlantic near the Azores and Madeira and have been reported from the Mediterranean as well as the eastern Caribbean (Bjorndal *et al.*, in press). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight-line carapace length they recruit to coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic and Gulf of Mexico.

Benthic immature loggerheads, the life stage following the pelagic immature stage, have been found from Cape Cod, Massachusetts, to southern Texas, and occasionally strand on beaches in northeastern Mexico (R. Márquez-M., pers. comm.). Large benthic immature loggerheads (70-91 cm) represent a larger proportion of the strandings and in-water captures (Schroeder *et al.*, 1998) along the south and western coasts of Florida as compared with the rest of the coast, which could indicate that the larger animals are either more abundant in these areas or just more abundant within the area relative to the smaller turtles. Benthic immature loggerheads foraging in northeastern U.S. waters are known to migrate southward in the fall as water temperatures cool (Epperly *et al.*, 1995; Keinath 1993; Morreale and Standora 1999; Shoop and Kenney 1992), and migrate northward in spring. Past literature gave an estimated age at maturity of 21-35 years (Frazer and Ehrhart 1985; Frazer *et al.*, 1994) and the benthic immature stage as lasting at least 10-25 years. However, NMFS SEFSC (2001) reviewed the literature and constructed growth curves from new data, estimating ages of maturity among the four models ranging from 20-38 years and benthic immature stage lengths from 14-32 years.

Adult loggerhead sea turtles have been reported throughout the range of this species in the United States and throughout the Caribbean Sea. As discussed in the beginning of this section, they nest primarily from North Carolina southward to Florida with additional nesting assemblages in the Florida Panhandle and on the Yucatán Peninsula. Non-nesting, adult female loggerheads are reported throughout the United States and Caribbean Sea; however, little is known about the distribution of adult males who are seasonally abundant near nesting beaches during the nesting season. Aerial surveys suggest that loggerheads (benthic immatures and adults) in U.S. waters are distributed in the following proportions: 54% in the southeast U.S. Atlantic, 29% in the northeast U.S. Atlantic, 12% in the eastern Gulf of Mexico, and 5% in the western Gulf of Mexico (TEWG 1998).

Based on the data available, it is difficult to estimate the size of the loggerhead sea turtle population in the United States or its territorial waters. There is, however, general agreement that the number of nesting females provides a useful index of the species' population size and stability at this life stage. Nesting data collected on index nesting beaches in the United States from 1989-1998 represent the best data set available to index the population size of loggerhead sea turtles. However, an important caveat for population trends analysis based on nesting beach data is that this may reflect trends in adult nesting females but not reflect overall population growth rates. Given this caveat, between 1989 and 1998, the total number of nests laid along the U.S. Atlantic and Gulf coasts ranged from 53,014 to 92,182 annually, with a mean of 73,751.

Since a female often lays multiple nests in any one season, the average adult female population of 44,970 was calculated using the equation [(nests/4.1) * 2.5]. These data provide an annual estimate of the number of nests laid per year while indirectly estimating both the number of females nesting in a particular year (based on an average of 4.1 nests per nesting female; Murphy and Hopkins (1984)) and of the number of adult females in the entire population (based on an average remigration interval of 2.5 years; Richardson *et al.*, 1978)). On average, 90.7% of these nests were from the south Florida subpopulation, 8.5% were from the northern subpopulation, and 0.8% were from the Florida Panhandle nest sites. There is limited nesting throughout the Gulf of Mexico west of Florida, but it is not known to which subpopulation the turtles making these nests belong. The number of nests in the northern subpopulation from 1989 to 1998 was 4,370 to 7,887, with a 10-year mean of 6,247 nests. With each female producing an average of 4.1 nests in a nesting season, the average number of nesting females per year in the northern subpopulation was 1,524. Assuming an average remigration rate of 2.5 years, the total nesting and non-nesting adult female population is estimated as 3,810 adult females in the northern subpopulation (TEWG, 1998, 2000).

The status of this northern population based on number of loggerhead nests has been classified as stable or declining (TEWG 2000). Another consideration adding to the vulnerability of the northern subpopulation is that NMFS scientists estimate, using genetics data from Texas, South Carolina, and North Carolina in combination with juvenile sex ratios from those states, that the northern subpopulation produces 65% males, while the south Florida subpopulation is estimated to produce 80% females (NMFS

SEFSC 2001, Part I).

The NMFS SEFSC report (2001) summarizes trend analyses for number of nests sampled from beaches for the northern subpopulation and the Florida subpopulation and concluded that from 1978-1990, the northern subpopulation has been stable at best and possibly declining (less than 5% per year). From 1990 to the present, the number of nests has been increasing at 2.8%-2.9% annually; however, there are confidence intervals about these estimates that include no growth (0%). Over the same time frame, the Florida numbers are 5.3%-5.4% per year over 1978-1990, and since 1990, 3.9%-4.2%.

From a global perspective, the southeastern U.S. nesting aggregation is an important component of this species. It is second in size only to the nesting aggregations in the Arabian Sea off Oman and represents about 35% and 40% of the nests of this species. The status of the Oman nesting beaches has not been evaluated recently, but they are located in a part of the world that is vulnerable to extremely disruptive events (*e.g.,* political upheavals, wars, and catastrophic oil spills). The resulting risk facing this nesting aggregation and these nesting beaches is cause for considerable concern (Meylan *et al.,* 1995).

Status and Trends

The most recent work regarding status and trends of loggerhead sea turtles is NMFS SEFSC (2001), which is incorporated herein by reference.

There is general agreement that the number of nesting females provides a useful index of the species' population size and stability at this life stage, even though there are uncertainties in estimating the overall population size. Nesting data collected on index nesting beaches in the United States from 1989-1998 represent the best data set available to index the population size of loggerhead sea turtles. However, an important caveat for population trends analysis based on nesting beach data is that this may reflect trends in adult nesting females but not overall population growth rates. Adult nesting females often account for less than 1% of total population numbers (NMFS SEFSC 2001).

The recovery plan for this species (NMFS and USFWS 1991) states that southeastern U.S. loggerheads can be considered for delisting if, over a period of 25 years, adult female populations in Florida are increasing and there is a return to pre-listing annual nest numbers of 800 in North Carolina, 10,000 in South Carolina, and 2,000 in Georgia. This equates to approximately 3,100 nesting females per year at 4.1 nests per female per season and a total population of about 7,800 adult females, with a 2.5 year remigration rate. Earlier, this Opinion provided estimates of the size of the adult female northern subpopulation of loggerheads (comprising females nesting from Amelia Island, Volusia County, Florida northward), based on nesting data from 1989-1998, at 3,810 adult females. In other words, at this gross level of analysis, levels of nesting and population sizes in the northern subpopulation may be slightly less than half of the recovery plan goals. Per its stated recovery goal, the nesting Florida subpopulation is increasing.

The TEWG (1998, 2000) concluded that the nesting trend for the northern subpopulation of loggerheads is stable or declining. The meta-analysis described in NMFS SEFSC 2001 report, however, suggests that, after 1989, the nesting activity for the northern subpopulation was increasing 2.8% to 2.9% per year but there are confidence intervals around these estimates that include no growth (0%). (The south Florida subpopulation is increasing 3.9% to 4.2% per year.). However, NMFS SEFSC (2001) cautions that "it is an unweighted analysis and does not consider the beaches' relative contribution to the total nesting activity of the subpopulation and must be interpreted with some caution." For example, South Carolina accounts for over half the total northern subpopulation nesting, and decreases in South Carolina nesting strongly affected the conclusions of TEWG (1998, 2000). In the meta-analysis, however, only a single South Carolina beach was used; and, although it has annual nestings of around 1,000, the proportional change in nesting at that beach was given equal weight to proportional changes at beaches with around 10 nests per year. Furthermore, although the analysis was limited to data from beaches where the effort was believed to have been relatively constant over time, this assumption of consistent effort may not always be true.

Several published reports have discussed the problems facing long-lived species that delay sexual maturity (Crowder *et al.*, 1994). In general, these reports concluded that animals that delay sexual maturity and reproduction must have high, annual survival as juveniles through adults to ensure that enough juveniles survive to reproductive maturity and then reproduce enough times to maintain stable population sizes. This general concept can be applied to sea turtles, as shown in several studies (Crouse *et al.,* 1987; Crowder *et al.,* 1994; Crouse 1999). However, this would mean it would be equally long periods of time before benefits from protection would also be seen; the long benthic juvenile stages (24 and 33 years in models) means a long time before these are translated into increasing numbers of nesting females on the beach. Heppell *et al.* (in press) specifically showed that the growth of the loggerhead sea turtle population was particularly sensitive to changes in the annual survival of both juvenile and adult sea turtles and that the adverse effects of the pelagic longline fishery on loggerheads from the pelagic immature phase appeared critical to the survival and recovery of the species. Crouse (1999) concluded that relatively small changes in annual survival rates of both juvenile and adult loggerhead sea turtles will adversely affect large segments of the total loggerhead sea turtle population. NMFS SEFSC (2001) concludes that juvenile stages have the highest elasticity and maintaining or decreasing current sources of mortality in those stages will have the greatest impact on maintaining or increasing population growth rates.

Threats from Natural Causes

Loggerhead sea turtles face numerous threats from natural causes. The five known subpopulations of loggerhead sea turtles in the northwest Atlantic and southeast United States are subject to fluctuations in the number of young produced annually because of natural phenomena, such as hurricanes, as well as human-related activities. There is a significant overlap between hurricane seasons in the Caribbean Sea and northwest Atlantic Ocean (June to November) and the loggerhead sea turtle nesting season (March to November). Hurricanes can have potentially disastrous effects on the survival of eggs in sea turtle nests. In 1992, Hurricane Andrew affected turtle nests over a 90-mile length of coastal Florida. All of the eggs were destroyed by storm surges on beaches that were closest to the eye of this hurricane (Milton *et al.,* 1992). On Fisher Island near Miami, Florida, 69% of the eggs did not hatch after Hurricane Andrew, probably because they were drowned by the storm surge. Nests from the northern subpopulation were destroyed by hurricanes which made landfall in North Carolina in the mid to late 1990s. Sand accretion and rainfall that result from these storms can appreciably reduce hatchling success. These natural phenomena probably have significant, adverse effects on the size of specific year classes, particularly given the increasing frequency and intensity of hurricanes in the Caribbean Sea and northwest Atlantic Ocean.

Threats from Human Activities

Some anthropogenic mortality that contributed to loggerhead declines, prior to listing under the ESA in 1978, have been mitigated over the years. These and other undocumented factors may be responsible for potentially increasing trends in nesting females seen since 1990 that appear in the NMFS SEFSC (2001) meta-analysis for the northern subpopulation of loggerheads. For example, direct takes of eggs and nesting females were prohibited and actions were taken in state waters to close fisheries for various reasons (*e.g.*, sturgeon fisheries using large mesh gillnets in S.C., Florida prohibition on entangling nets). A summary of recent stranding trends provided in NMFS SEFSC (2001) notes that from 1998-2000, strandings decreased in traditionally high stranding zones on the Atlantic coast but doubled to historic levels along the southern Florida Gulf coast and in the Florida Keys, possibly due to a persistent red tide.

A number of anthropogenic impacts were identified by NRC (1990) and NMFS & USFWS (1991) fo loggerhead sea turtles, but baseline analysis is complicated by the fact that these impacts (other than drowning in bottom trawls) are largely unquantified. The known sources of impact were included in NMFS SEFSC (2001) Appendix 2. These fall into several categories that impact sea turtles both domestically and internationally: trawl fisheries, gillnet fisheries, hook and line fisheries, pelagic longline fisheries, pound nets, fish traps, lobster pots, whelk pots, long haul seines, and channel nets, as well as non-fishery impacts such as power plants, marine pollution including marine debris, and direct harvest of eggs and adults in foreign countries, oil and gas exploration, development, and transportation, underwater explosions, dredging, offshore artificial lighting, marina and dock construction and operation, boat collisions, and poaching. On their nesting beaches in the United States, loggerhead sea turtles are threatened with beach erosion, armoring, and renourishment; artificial lighting; beach cleaning; increased human presence; recreational beach equipment; exotic dune and beach vegetation; predation by species such as fire ants, raccoons (*Procyon lotor*), armadillos (*Dasypus novemcinctus*), opossums (*Didelphus virginiana*); and poaching. Some of these threats are discussed in more detail below. A more thorough description of anthropogenic mortality sources is provided in the TEWG reports (1998, 2000) and in NMFS SEFSC (2001).

Although sea turtle nesting beaches are protected along large expanses of the northwest Atlantic coast (in areas like Merritt Island, Archie Carr, and Hobe Sound National Wildlife Refuges), other areas along these coasts have limited or no protection and probably cause fluctuations in sea turtle nesting success. Volusia County, Florida, for example, allows motor vehicles to drive on sea turtle nesting beaches (the County has filed suit against the USFWS to retain this right) and sea turtle nesting in Indian River, Martin, West Palm, and Broward counties of Florida can be affected by beach armoring, beach renourishment, beach cleaning, artificial lighting, predation, and poaching.

The survival of juvenile loggerhead sea turtles is threatened by a completely different set of threats from human activity once they migrate to the ocean. A proportion of the pelagic immature loggerhead sea turtles from the western Atlantic circumnavigate the North Atlantic over several years (Carr 1987, Bjorndal 1994). During that period, they are exposed to a series of longline fisheries. The U.S. is only one of 23 countries fishing in the Atlantic Ocean and Mediterranean Sea with pelagic longlines from 1990-1997 (Carocci and Majowski 1998). Most of the foreign high seas fisheries in the Atlantic are similar to the United States in number of fishing days and miles of line per day, with some exceptions, such as the Mediterranean fleet which fishes smaller vessels, once per night and close to shore (NMFS SEFSC 2001). In the North Atlantic, the U.S. fleet was roughly 4-8 times more efficient (proportion catch/proportion hooks) than the other fleets at catching swordfish and 2-3 times more efficient at catching tunas.

Loggerheads are primarily exposed to these fleets in the pelagic juvenile stage. According to observer records, an estimated 7,891 loggerhead sea turtles were caught by the U.S. Atlantic tuna and swordfish longline fisheries between 1992-1999, of which 66 were discarded dead (NMFS SEFSC 2001). However, the U.S. fleet accounts for a small proportion (5%-8%) of the hooks fished in the Atlantic Ocean compared to other nations, including Taipei, Brazil, Trinidad, Morocco, Cyprus, Venezuela, Korea, Mexico, Cuba, United Kingdom, Bermuda, People's Republic of China, Grenada, Canada, Belize, France, and Ireland (Carocci and Majkowski 1998). Reports of incidental takes of turtles are incomplete for many of these nations (see NMFS SEFSC 2001, Part II, Chapter 5, p. 162 for a complete description of take records). For example, bottom set lines in the coastal waters of Madeira, Portugal, are reported to take an estimated 500 pelagic immature loggerheads each year (Dellinger and Encarnacao 2000). Based on their proportional distribution, the capture of immature loggerhead sea turtles in longline fleets in the Azores and Madeira Archipelagoes and the Mediterranean Sea will have a significant, adverse effect on the annual survival rates of juvenile loggerhead sea turtles from the western Atlantic subpopulations. Considerably more loggerheads than leatherbacks are taken in the Mediterranean Sea. Another example is the Mexican fishery in the Gulf of Mexico which incidentally captures 5 turtles per 100 trips with mortality estimated at 1.6 turtles per 100 trips. Adding up the under-represented observed takes per country per year of 23 actively fishing countries likely results in an estimate of thousands of animals annually over different life stages.

In waters off the coastal United States, the survival of juvenile loggerhead sea turtles is affected by a suite of fisheries in federal and state waters (see *Effects of the Action*, Section 4). Loggerhead turtles are captured, injured, or killed in shrimp fisheries off the Atlantic coast; along the southeastern Atlantic coast, loggerhead turtle populations were declining in the presence of shrimp fishing off the nesting beaches, before the required use of TEDs (Magnuson *et al.,* 1990). Conversely, these nesting populations did not appear to be declining where nearshore shrimping effort is low or absent. The management of shrimp harvest in the Gulf of Mexico demonstrates the correlation between shrimp trawling and impacts to sea turtles. Waters out to 200 nm are closed to shrimp fishing off Texas each year for approximately a 3-month period (mid-May through mid-July) to allow shrimp to migrate out of estuarine waters; sea turtle strandings decline substantially during this period (NMFS, STSSN unpublished data).

Loggerhead sea turtles are captured in fixed pound net gear in the Long Island Sound, in pound net gear and trawls in summer flounder and other finfish fisheries in the mid-Atlantic and Chesapeake Bay, in gillnet fisheries in the mid-Atlantic and elsewhere, in fisheries for monkfish and for spiny dogfish, and in northeast sink gillnet fisheries. Capture rates of sea turtles in the longline fishery are second only to those of the U.S. shrimp fishing fleet (Crouse 1999, Magnuson *et al.,* 1990), although shrimping probably does not significantly impact immature, pelagic stage loggerheads.

Although loggerhead sea turtles are most vulnerable to pelagic longlines during their pelagic, immature life history stage, there is some evidence that benthic immatures may also be captured, injured, or killed by pelagic fisheries. Any loggerhead sea turtles that follow this developmental model of moving back and forth between pelagic and coastal habitats could be adversely affected by shark gillnets and shark bottom longlines set in coastal waters, in addition to pelagic longlines.

Virtually all of the pelagic immature loggerheads taken in the Portuguese longline fleet in the vicinity of the Azores and Madeira are from western North Atlantic nesting subpopulations (Bolten *et al.,* 1994, 1998) and about half of those taken in both the eastern and western basins of the Mediterranean Sea are from the western North Atlantic subpopulations (Bowen *et al.*, 1993; Laurent *et al.*, 1998). Aguilar *et al.* (1995) estimated that the Spanish swordfish longline fleet, which is only one of the many fleets operating in the region, alone captures more than 20,000 juvenile loggerheads annually, killing an estimated 20%-30%. Estimated bycatch of marine turtles by the U.S. Atlantic tuna and swordfish longline fisheries, based on observer data, was significantly greater than reported in logbooks through 1997 (Johnson *et al.*, 1999; Witzell 1999), but was comparable by 1998 (Yeung 1999). Observer records indicate that an estimated 6,544 loggerheads were captured by the U.S. fleet between 1992-1998, of which an estimated 43 were dead (NMFS SEFSC 2001). Aguilar *et al.* (1995) reported that hooks were removed from only 171 of 1,098 loggerheads captured in the Spanish longline fishery, describing that removal was possible only when the hook was found in the mouth, the tongue or, in a few cases, externally (flippers, *etc.*); the presumption is that all others had ingested the hook.

From 1981-1990, 397 loggerhead sea turtles were incidentally captured in gillnets set by Italian fishermen in the central Mediterranean Sea; gillnet mortality was reported to be 73.6%. An additional study estimated 16,000 loggerheads per year are captured by net with 30% mortality. Observers of the Spanish driftnet fishery in the western Mediterranean documented the incidental capture of 30 loggerheads from 1993-1994, of which one was dead; 236 loggerheads were estimated to have been caught in 1994. Six-hundred loggerheads are estimated to have been caught annually by gillnet in Nicaragua. Gillnets set for finfish and sharks in Belize are also suspected of catching sea turtles (see NMFS SEFSC 2001).

Bottom set lines in the coastal waters of Madeira, Portugal, are reported to take an estimated 500 pelagic immature loggerheads each year. Adult female loggerheads are taken by hand by the indigenous people inhabiting Boavista Island, Cape Verde, Western Africa. In Cuba, loggerheads are commercially harvested (see NMFS SEFSC 2001).

An additional source of mortality is ingestion of marine debris. A summary of marine debris impacts can be found in the TEWG reports (1998, 2000) and NMFS SEFSC (2001).

Leatherback Turtle *(Dermochelys coriacea)*

The Recovery Plan for Leatherback Turtles (*Dermochelys coriacea*) contains a description of the natural history and taxonomy of this species (USFWS and NMFS 1992). Leatherbacks are widely distributed throughout the oceans of the world, and are found in waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour 1972). Adult leatherbacks forage in temperate and subpolar regions from 71°N to 47°S latitude in all oceans and undergo extensive migrations to and from tropical nesting beaches between 90°N and 20°S. In the Atlantic Ocean, leatherbacks have been recorded as far north as Newfoundland and Labrador, Canada and Norway, and as far south as Uruguay and Argentina and South Africa (see NMFS SEFSC 2001).

Female leatherbacks nest from southeastern United States to southern Brazil in the western Atlantic and from Mauritania to Angola in the eastern Atlantic. The most significant nesting beaches in the Atlantic, and perhaps in the world, are in French Guiana and Suriname (see NMFS SEFSC 2001). When they leave the nesting beaches, leatherbacks move offshore but eventually utilize both coastal and pelagic waters. Leatherbacks are deep divers, with recorded dives to depths in excess of 1000 m (Eckert *et al.*, 1989), but they may come into shallow waters if there is an abundance of jellyfish nearshore. Leary (1957) reported a large group of up to 100 leatherbacks just offshore of Port Aransas, Texas, associated with a dense aggregation of *Stomolophus*. They also occur annually in places such as Cape Cod Bay and Narragansett Bay during certain times of the year, particularly during the fall. Shoop and Kenney (1992) summarized 3 years of survey effort from the eastern Atlantic out to the 2000 m isobath and reported leatherback turtles throughout the study area, both inside and outside the 200 m isobath. A summer seasonal peak in sea turtle density was noted throughout the study area. Density estimates from a dedicated NMFS NEFSC aerial survey in July and August of 1995 and 1998 supported these results.

The leatherback is the largest living turtle and it ranges farther than any other sea turtle species, exhibiting broad thermal tolerances (NMFS and USFWS 1995). Leatherback turtles feed primarily on cnidarians (medusae, siphonophores) and tunicates (salps, pyrosomas) and are often found in association with jellyfish.

Although leatherbacks are a long-lived species (> 30 years), they are somewhat faster to mature than loggerheads, with an estimated age at sexual maturity reported as about13-14 years for females, and an estimated minimum age at sexual maturity of 3-6 years, with 9 years reported as a likely minimum (Zug 1996) and 19 years as a likely maximum (NMFS SEFSC 2001). They nest frequently (up to 7 nests per year) during a nesting season and nest about every 2-3 years. During each nesting, they produce 100 eggs or more in each clutch and, thus, can produce 700 eggs or more per nesting season (Schultz 1975).

Genetics

Genetic analyses of leatherbacks to date indicate that within the Atlantic basin significant genetic differences occur among St. Croix, U.S. Virgin Islands, and mainland Caribbean populations (Florida, Costa Rica, Suriname/French Guiana) and between Trinidad and the same mainland populations (Dutton *et al.,* 1999) leading to the conclusion that there are at least three separate subpopulations of leatherbacks in the Atlantic. Much of the genetic diversity is in the relatively small insular subpopulations.

Genetic analyses indicate that female leatherback turtles nesting in St.Croix/Puerto Rico and those nesting in Trinidad differ from each other and from turtles nesting in Florida, French Guiana/Suriname and along the South African Indian Ocean coast. Turtles nesting in Florida, French Guiana/Suriname and South Africa cannot be distinguished at this time with mtDNA. The largest known nesting aggregation of the leatherback turtles in the western North Atlantic Ocean occurs in French Guiana. This may be the largest nesting aggregation of leatherback turtles in the world (see NMFS SEFSC 2001).

The analysis of mitochondrial DNA (mtDNA) indicate that the loss of the nesting populations from the St. Croix region and Trinidad would essentially eliminate most of the detected mtDNA variation throughout the Atlantic (Dutton *et al.*, 1999). To date, no studies have been published on the genetic make-up of pelagic or benthic foraging leatherbacks in the Atlantic. Compared to current knowledge regarding loggerhead populations, the genetic distinctness of leatherback populations is less clear and populations or subpopulations of leatherback sea turtles have not been formally recognized based on genetic studies. This Opinion, therefore, considers the status of the various nesting populations, as well as the Atlantic and worldwide populations.

The nesting aggregation in French Guiana has been declining at about 15% per year since 1987. From the period 1979-1986, the number of nests was increasing at about 15% annually. The number of nests in Florida and the U.S. Caribbean has been increasing at about 10.3% and 7.5%, respectively, per year since the early 1980s but the magnitude of nesting is much smaller than that along the French Guiana coast (see NMFS SEFSC 2001).

Status and Trends

Initial estimates of the worldwide leatherback population were between 29,000 and 40,000 breeding females (Pritchard 1971), later refined to approximately 115,000 adult females globally (Pritchard 1982). An estimate of 34,500 females (26,200-42,900) was made by Spotila *et at.* (1996), along with a claim that the species as a whole was declining and local populations were in danger of extinction (NMFS SEFSC 2001). They attribute this to fishery related mortality but, at least historically, it was due primarily to intense exploitation of the eggs (Ross 1979). On some beaches in the Pacific, nearly 100% of the eggs laid have been harvested (Eckert 1996). Eckert (1996) and Spotila *et al.* (19ꞩ5) record that adult mortality has also increased significantly, particularly as a result of driftnet and longline fisheries. The Pacific population is in a critical state of decline, now estimated to number less than 3,000 total adult and subadult animals (Spotila *et al.*, 2000). The status of the Atlantic population is less clear. In 1996, it was reported to be stable, at best (Spotila 1996), but numbers in the western Atlantic at that writing were reported to be on the order of 18,800 nesting females. According to Spotila (pers. comm.), the western Atlantic population currently numbers about 15,000 nesting females, whereas current estimates for the Caribbean (4,000) and the eastern Atlantic (*i.e.*, off Africa, numbering ~ 4,700) have remained consistent with numbers reported by Spotila *et al.*, in 1996. Spotila *et al.* (2000) indicates that between 1989 and 1995, marked leatherback returns to the nesting beach at St. Croix averaged only 48.5%, but that the overall nesting population grew. This is in contrast to a Pacific nesting beach at Playa Grande, Costa Rica, where only 11.9% of turtles tagged in 1993-94 and 19.0% of turtles tagged in 1994-95 returned to nest over the next 5 years. Characterizations of the Pacific population suggest that is has a very low likelihood of survival and recovery in the wild under current conditions. However, NMFS SEFSC (2001) note that while all these authors have noted dramatic declines in Pacific nesting beaches, they have suggested apparently stable or increasing nesting populations in the Atlantic.

Nest counts are the only reliable population information available for leatherback turtles. Recent declines have been seen in the number of leatherbacks nesting worldwide (NMFS and USFWS 1995). Natural fluctuations such as an annual cycle or the fact that females may shift their nesting efforts in places like Suriname due to erosion at French Guiana, for example, complicate analysis of trends based on that data. Another important factor is that nesting trends reflect trends in adult females, a small proportion of the population, and may not be valid for the rest of the population (NMFS SEFSC 2001). The status of the leatherback population in the Atlantic is difficult to assess since major nesting beaches occur over broad areas within tropical waters outside the United States. Although leatherbacks occur in all U.S. Atlantic, Gulf, and Caribbean waters, it is estimated that about 250 females now visit nesting sites in the United States (*i.e.*, Florida, Puerto Rico and the U.S. Virgin Islands) (NMFS SEFSC 2001). The primary leatherback nesting beaches occur in French Guiana, Suriname, and Costa Rica in the western Atlantic, and in Mexico in the eastern Pacific. Although increased observer effort on some nesting beaches has resulted in increased reports of leatherback nesting, declines in nest abundance have been reported from the beaches of greatest nesting densities.

The major western Atlantic nesting area for leatherbacks is located in the Suriname-French Guiana trans-boundary region. Chevalier and Girondot (1998) report that combined nesting in the two countries has been declining since 1992. Nesting also occurs on Florida's east coast. In 1998 the Florida Department of Environmental Protection reported 351 nests and 146 false crawls on the east coast of Florida. In the eastern Caribbean, nesting occurs primarily in the Dominican Republic, the Virgin Islands, and on islands near Puerto Rico. Sandy Point, on the western edge of St. Croix, Virgin Islands, has been designated by the U.S. Fish and Wildlife Service as critical habitat for nesting leatherback turtles.

The current status of nesting populations in French Guiana and Suriname is difficult to interpret because these beaches are so dynamic geologically. Schulze (1975) described a 10-year cycle of beach accretion and erosion in Guyana that could explain part of the cycle observed in nesting over the last 30 years. Chevalier *et al.* (in press) states that since the mid-1970s leatherback nesting has declined (1987-1992 mean = 40,950 nests and 1993-1998 mean = 18,100 nests). They state that there is very little shifting in nesting from French Guiana and Suriname to other Caribbean sites (there has only been 1 tag recapture elsewhere). Numbers are decreasing in Suriname, too. Chevalier *et al.* (in press) claims that there is no human-induced mortality on the beach in French Guiana, and natural mortality of adults should be low. There has been very low hatchling success on beaches used for the last 25 years.

Zug (1996) pointed out that the combination of the loss of long-lived adults in fishery-related mortality, and the lack of recruitment stemming from elimination of annual influxes of hatchlings because of intense egg harvesting, has caused the sharp decline in leatherback populations. The author stated that "the relatively short maturation time of leatherbacks offers some hope for their survival if we can greatly reduce the harvest of their eggs and the accidental and intentional capture and killing of large juveniles and adults."

In summary, the conflicting information regarding the status of Atlantic leatherbacks makes it difficult to conclude whether or not the population is currently in decline. Numbers at some nesting sites are up, while at others they are down. Data collected in southeast Florida clearly indicate increasing numbers of nests for the past twenty years (9.1%-11.5% increase), although it should be noted that there was also an increase in the survey area in Florida over time (NMFS SEFSC 2001). At one site (St. Croix), population growth has been documented despite large apparent mortality of nesting females; for data from 1979 on from St. Croix, the number of nests is estimated to be increasing at 7.5% per year (NMFS SEFSC 2001). However, the largest leatherback rookery in the western North Atlantic remains along the northern coast of South America in French Guiana and Suriname. While Spotila *et al.* (1996) indicated that turtles may have been shifting their nesting from French Guiana to Suriname due to beach erosion, analyses show that the overall area trend in number of nests has been negative since 1987 at a rate of 15.0%-17.3 % per year (NMFS SEFSC 2001, Appendix 1). If turtles are not nesting elsewhere, it appears that the western Atlantic portion of the population is being subjected to mortality beyond sustainable levels, resulting in a continued decline in numbers of nesting females.

As noted above, there are many human-related sources of mortality for leatherbacks. Due to a combination of factors, including the continued harvest of eggs and adult turtles for meat in some Caribbean and Latin nations, the effects of ocean pollution, and natural disturbances such as hurricanes (which may destroy nesting beaches), it is clear that the endangered leatherback populations of the Atlantic require major conservation efforts to ensure their long-term survival and recovery in the wild.

The U.S. pelagic longline fishery, in combination with the foreign longline fleets and coastal fishery, could produce sufficient leatherback mortality to result in the decreases evident on South American nesting beaches. On the other hand, large removals of eggs alone could produce the same result and would be evidenced on the nesting beach quickly. In order to determine the impact of longline fleets, there needs to be an apportionment of turtles by nesting beach origin and the mortality rate needs to be quantified (NMFS SEFSC 2001, Part III, Chap. 7). Other clear concerns for South American nesting turtles are impacts on French Guiana and Suriname beaches. Even if the longline takes were eliminated, those declines would not likely reverse. On the other hand, if measures to reduce mortality occur in French Guiana and Suriname, that alone could be enough to reverse those declines.

Effects from Human Activities

Of the Atlantic turtle species, leatherback turtles seem to be the most susceptible to entanglement in fishing gear with lines, such as lobster gear lines and longline gear rather than swallowing hooks. This susceptibility may be the result of attraction to gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface, and perhaps to the lightsticks used to attract target species in the longline fishery. They are also just as susceptible to trawl capture as the other species.

Chevalier *et al.* (in press) indicates that threats to the population include fishing (longlines, drift nets, and trawling), pollution (plastic bags and chemicals), and boat propellers. Around 90% of the nests are laid within 25 km of the Maroni (also "Marowijne" or "Marouini") River estuary. Strandings in 1997, 1998, and 1999 in the estuary were 70, 60, and 100, which Chevalier *et al.* (in press) considers underestimates. They questioned the fishermen and actually observed a 1-km gillnet with 7 dead leatherbacks. This observation, coupled with the strandings, led the authors to conclude that there were large numbers captured incidentally in large-mesh nets. There are protected areas nearshore in French Guiana; offshore, driftnets are set. There are no such protected areas off Suriname, and fishing there occurs at the beach. Offshore nets soak overnight in Suriname; many boats fish overnight. According to Chevalier *et al.* (in press), the French Guiana government is establishing a working group to deal with accidental capture and to enforce the legislation. They will work towards the management of the fishery activity, collaborate with Suriname, study the accidental capture by the fishermen, satellite track turtles, and study strandings. The main problem appears to be the close proximity of the driftnet fishery to the nesting areas and shrimp trawling off beaches without TEDs. Tag return data emphasize the global nature of the leatherback and the link between these South American nesters and animals found in U.S. waters. For example, a nesting female tagged May 29, 1990, in French Guiana was later recovered and released alive from the York River. Another nester tagged in French Guiana on June 21, 1990, was later found dead in Palm Beach, Florida (STSSN database, unpubl.).

Swinkels and van Tienen (in press) state that from 1995-1999 there was a large increase in leatherback nesting in Suriname. There is a nature reserve in Suriname and one in adjacent French Guiana. There were increasing population trends observed on three beaches but poaching of the nests was 80%. Samsambo Beach in Suriname is a very dynamic beach, which has been newly created (by natural events) and now is a nesting beach. In 1999 there were > 4,000 nests, of which about 50% were poached. In 1995, very few were poached but Swinkels and Tienen indicate that since that time poaching has increased. The beach has naturally been renourished over this period. Swinkels and Tienen's null hypothesis was that there had been a shift in nesting activity (from other nesting areas). The alternate hypothesis was that the new nesting represented new recruitment to the population.

Leatherbacks are exposed to pelagic fisheries throughout their life cycle. According to observer records, an estimated 6,363 leatherback sea turtles were caught by the U.S. Atlantic tuna and swordfish longline fisheries between 1992-1999, of which 88 were discarded dead (NMFS SEFSC 2001). Leatherbacks make up a significant portion of takes in the Gulf of Mexico and South Atlantic areas, but are more often released alive. However, the U.S. fleet accounts for a small portion (5%-8%) of the hooks fished in the Atlantic Ocean compared to other nations, including Taipei, Brazil, Trinidad, Morocco, Cyprus, Venezuela, Korea, Mexico, Cuba, United Kingdom, Bermuda, People's Republic of China, Grenada, Canada, Belize, France, and Ireland (Carocci and Majkowski 1998). Reports of incidental takes of turtles are incomplete for many of these nations (see NMFS SEFSC 2001, Part II, Chapter 5, p. 162 for a complete description of take records). Adding up the under-represented observed takes per country per year of 23 actively fishing countries would likely result in estimates of thousands of sea turtles annually over different life stages.

Ingestion of Marine Debris

Leatherback sea turtles may be more susceptible to marine debris ingestion than other species due to their pelagic existence and the tendency of floating debris to concentrate in convergence zones which adults and juveniles use for feeding areas and migratory routes (Lutcavage *et al.,* 1997; Shoop and Kenney 1992). Investigations of the stomach contents of leatherback sea turtles revealed that a substantial percentage (44% of the 16 cases examined) contained plastic (Mrosovsky 1981). Along the coast of Peru, intestinal contents of 19 of 140 (13%) leatherback carcasses were found to contain plastic bags and film (Fritts 1982). The presence of plastic debris in the digestive tract suggests that leatherbacks might not be able to distinguish between prey items and plastic debris (Mrosovsky 1981). Balazs (1985) speculated that the object may resemble a food item by its shape, color, size or even movement as it drifts about, and induce a feeding response. Although necropsies conducted between 1980 and 1992 by the Sea Turtle Stranding and Salvage Network (STSSN) participants showed that leatherbacks were more likely to ingest marine debris in the southeastern United States than in the northeast, it was noted that leatherbacks also consume plastic bags in the northeastern United States (Witzell and Teas 1994). However, when data were included through 1999, the majority (72%) of leatherbacks that had ingested marine debris or fishing gear were found from Virginia through Maine. Of the 33 leatherbacks that were necropsied in New York, plastic bags were found in 10 animals (Sadove and Morreale 1990). (*In* NMFS SEFSC 2001, Part II.)

Entanglements

Sea turtles entangled in fishing gear generally have a reduced ability to feed, dive, surface to breathe, or perform any other behavior essential to survival (Balazs 1985). They may be more susceptible to boat strikes if forced to remain at the surface, and entangling lines can constrict blood flow resulting in necrosis *(Ibid.)*. Leatherbacks seem more likely to become entangled in fishing gear than other species. Leatherback entanglement in longline fishing gear is discussed in NMFS SEFSC 2001, Part III, Chapter 7. The fish trap fishery, operating in Rhode Island from March through December, is known to capture sea turtles. Leatherbacks have been captured alive in large fish traps set off Newport – most are reported to be released alive (Anon. 1995). Of the approximately 20 live, entangled sea turtles reported by the NMFS Northeast Region Stranding Network, the majority were leatherback sea turtles entangled in pot gear in New England waters. The leatherbacks become entangled in the buoy line and/or ground line, possibly mistaking the buoys for cannonball jellyfish (Anon. 1995). Massachusetts, Rhode Island, Connecticut, and New York all have active lobster pot fisheries which can entangle leatherbacks (Anon. 1995). Entanglement in lobster pot lines was cited as the leading determinable cause of adult leatherback strandings in Cape Cod Bay, Massachusetts (Prescott 1988; R. Prescott, pers. comm.). During the period 1977-1987, 89% of the 57 stranded adult leatherbacks were the result of entanglement (Prescott 1988). Likewise, during the period 1990-1996, 58% of the 59 stranded adult leatherbacks showed signs of entanglement (R. Prescott, pers. comm.). Many of the stranded leatherbacks for which a direct cause of death could not be documented showed evidence of rope scars or wounds and abraded carapaces, implicating entanglement *(Ibid.)*.

In the U.S. mid-Atlantic waters, the blue crab fishery is another potential source of leatherback entanglement. In North Carolina, two leatherback sea turtles were reported entangled in a crab pot buoy inside Hatteras Inlet (D. Fletcher, pers. comm.). A third leatherback was reported entangled in a crab pot buoy in Pamlico Sound off Ocracoke.. This turtle was disentangled and released alive; however, lacerations on the front flippers from the lines were evident (D. Fletcher, pers. comm.). Leatherbacks become entangled in Florida's lobster pot and stone crab fisheries also, as documented on stranding forms.

Although not documented as the major cause of leatherback strandings in the U.S. Virgin Islands for the time period 1982 to1997 (1 of 5 leatherbacks stranded due to entanglement out of a total of 122 strandings) (Boulon 2000), leatherbacks have been observed with their flippers wrapped in the line of West Indian fish traps (R. Boulon, pers. comm.). STSSN leatherback strandings for 1980-1999 documented significantly more strandings as a result of entanglement in the northern states (Virginia to Maine; 62%) than southern (Florida's east coast to North Carolina; 18%) or Gulf states (Florida's west coast to Texas; 19%). The majority (67%) of these strandings were the result of being entangled in crab or lobster trap lines; additional sources of entanglement included entanglement in fishing line or nets or having a hook in the mouth or flipper (*In* NMFS SEFSC 2001, Part II).

Leatherback sea turtles also are vulnerable to capture in gillnets. Gillnet fisheries operating in the nearshore waters of the mid-Atlantic states are likely to take leatherbacks since these fisheries and leatherbacks may co-occur; however, there is very little quantitative data on capture rate and mortality. According to the NMFS NEFSC Fisheries Observer Program, in 1994, 2 live and 2 dead leatherback sea turtles were reported incidentally captured in drift gillnets set in offshore waters from Maine to Florida (with 56% observer coverage); in 1995, 15 live and 12 dead leatherback sea turtles were reported (70% coverage); in 1996, 1 live leatherback was reported (54% coverage); in 1998, 3 live and 2 dead leatherbacks were reported (92% coverage). The NMFS NEFSC Fisheries Observer Program also had observers on the bottom coastal gillnet fishery which operates in the mid-Atlantic, but no takes of leatherback sea turtles were observed from 1994-1998. Observer coverage of this fishery, however, ranged from <1% to 5%. In North Carolina, a leatherback was reported captured in a gillnet set in Pamlico Sound at the north end of Hatteras Island in the spring of 1990 (D. Fletcher, pers. comm.). It was released alive by the fishermen after much effort.

Five other leatherbacks were released alive from nets set in North Carolina during the spring months: one was from a net (unknown gear) set in the nearshore waters near the North Carolina/Virginia border (1985); two others had been caught in gillnets set off Beaufort Inlet (1990); a fourth was caught in a gillnet set off of Hatteras Island (1993); and a fifth was caught in a sink net set in New River Inlet (1993) *(Ibid.)*. In September of 1995, however, two dead leatherbacks were removed from a large (11-inch) monofilament shark gillnet set in the nearshore waters off Cape Hatteras, North Carolina *(Ibid.)*. Gillnets set in northwest Atlantic coastal waters are reported to routinely capture leatherback sea turtles (Goff and Lien 1988; Goff *et al.*, 1994; Anon. 1996). Leatherbacks often drown in fish nets set in coastal waters of Sao Tome, West Africa (Castroviejo *et al.*, 1994; Graff 1995). Gillnets are one of the suspected causes for the decline in the leatherback sea turtle population in French Guiana (Chevalier *et al.*, 1999). In the waters of coastal Nicaragua, gillnets targeting green and hawksbill turtles also incidentally catch leatherback turtles (Lagueux *et al.*, 1998). An estimated 1,000 mature female leatherback sea turtles are caught annually off of Trinidad and Tobago with mortality estimated to be between 50%-95% (Eckert and Lien 1999). Many of the turtles do not die as a result of drowning, but rather because the fishermen butcher them in order to get them out of their nets (*Ibid.*) (*In* NMFS SEFSC 2001, Part II).

The National Research Council Committee on Sea Turtle Conservation identified incidental capture in shrimp trawls as the major anthropogenic cause of sea turtle mortality (National Research Council 1990). Although Federal regulations requiring TEDs in trawls were fully implemented in May 1991 and U.S. sea turtle strandings have declined since then (Crouse, Crowder, and Heppell *unpubl.* as cited by Crowder *et al.*, 1995), trawls equipped with TEDs are still taking large immature and adult loggerhead and green sea turtles (Epperly and Teas 1999) and leatherbacks (Henwood and Stuntz 1987). As leatherbacks make their annual spring migration north, they are likely to encounter shrimp trawls working in the nearshore waters off the Atlantic coast. Although the Leatherback Contingency Plan was developed to protect migrating leatherbacks from being incidentally captured and killed in shrimp trawls, NMFS has also had to implement additional leatherback protections outside of the contingency plan, through emergency rules in response to high strandings of leatherbacks in Florida and Texas. Because of these high leatherback strandings occurring outside the leatherback conservation zone, the lack of aerial surveys conducted in the fall, the inability to conduct required replicate surveys due to weather, equipment or personnel constraints, and the possibility that a 2-week closure was insufficient to ensure that leatherbacks had vacated the area, NMFS published an Advanced Notice of Proposed Rulemaking in April 2000 (65 FR 17852-17854, April 5, 2000) indicating that NMFS was considering publishing a proposed rule to provide additional protection for leatherback turtles in the shrimp fishery. NMFS requested all shrimp trawlers to use TEDs modified to release leatherback sea turtles along the east coast of Florida to the Georgia/Florida border through the end of March 2000 (December 11, 2000, NR00-061). This request had the effect of protecting leatherbacks during the winter Florida shrimp season that tend to stay in this area until the start of the spring migration.

Turtle excluder devices are required in the mid-Atlantic winter trawl fishery for summer flounder in waters south of Cape Charles, Virginia; however, these small TEDs cannot exclude leatherback sea turtles. Although not documented, it is suspected that this and other trawl fisheries may take turtles north of Cape Charles where TEDs are not required. In Rhode Island, leatherbacks are occasionally taken by trawlers targeting scup, fluke, and monkfish in state waters (Anon. 1995). It is likely that leatherbacks may be taken by trawlers operating off other mid-Atlantic states. Observers onboard shrimp trawlers operating in the northeastern region of Venezuela documented the capture of 48 sea turtles, of which 6 were leatherbacks, from 13,600 trawls (Marcano and Alio 2000). They estimated annual capture of all sea turtle species to be 1,370 with an associated mortality of 260 turtles, or about 19% (*In* NMFS SEFSC 2001, Part II).

Poaching

NMFS SEFSC (2001) notes that poaching is still occurring in the U.S. Virgin Islands, both juveniles and adults. Four of the five strandings in St. Croix were the result of poaching (Boulon 2000). A few cases of fishermen poaching leatherbacks have been reported from Puerto Rico, but most of the poaching is of eggs. In Ghana, nearly two thirds of the leatherback sea turtles that come up on the beach are killed by local fishermen.

Green Turtles *(Chelonia mydas)*

Taxonomy, Genetic Stocks, and Distribution within the NMFS Southeast Region

Linnaeus first described the green turtle as *Testudo mydas* in 1758 from a specimen taken at Ascension Island, and Brongniart first assigned the green turtle to the genus *Chelonia* in 1800. As new locations for the green turtle (*Chelonia mydas*) were studied, the species came to be known as one having a number of morphologically distinct assemblages worldwide (reviews are given by Hirth 1997, Pritchard and Trebbau 1984, and Groombridge and Luxmoore 1989).

Assemblages of green turtles are best known where they nest and the relatedness of these nesting assemblages is strongly influenced by the natal beach homing of females (assessment is from mitochondrial DNA analysis, Bowen *et al.*, 1992, Allard *et al.*, 1994). Examinations of nuclear DNA show that male-mediated gene flow between nesting assemblages is moderate but is limited by the distance between respective breeding sites (Karl *et al.*, 1992). Thus, the overall relatedness of green turtle assemblages appears to follow lines of geographical separation of nesting beaches.

The greatest genetic differences between green turtle stocks occur between two ocean regions, the Atlantic-Mediterranean and the Indian-Pacific Oceans (from mitochondrial DNA analysis; Bowen *et al.*, 1992). However, within each of these ocean regions there are many genetically distinct stocks. In the western Atlantic, the most distinctive split is between eastern (Florida/Mexico and Costa Rica) and western (Aves Island and Suriname) stocks, although each of the four stocks can be genetically separated (Lahanas *et al.*, 1994).

The complete nesting range of the green turtle within the NMFS Southeast Region includes sandy beaches of mainland shores, barrier islands, coral islands, and volcanic islands between Texas and North Carolina and at the U.S. Virgin Islands (USVI) and Puerto Rico (NMFS and USFWS 1991). Principal U.S. nesting areas for green turtles are in eastern Florida, predominantly Brevard through Broward Counties (Ehrhart and Witherington 1992). Regular green turtle nesting also occurs on St Croix, USVI, and on Vieques, Culebra, Mona, and the main island of Puerto Rico (Mackay and Rebholz 1996, C. Diez pers. comm.).

Green turtle foraging areas in the region include any neritic waters having macroalgae or seagrasses near mainland coastlines, islands, reefs, or shelves, and any open-ocean surface waters, especially where advection from wind and currents concentrates pelagic organisms (Hirth 1997, NMFS and USFWS 1991). Principal benthic foraging areas in the region include Aransas Bay, Matagorda Bay, Laguna Madre, and the Gulf inlets of Texas (Doughty 1984, Hildebrand 1982, Shaver 1994), Gulf of Mexico off Florida from Yankeetown to Tarpon Springs (Caldwell and Carr 1957, Carr 1984), Florida Bay and the Florida Keys (Schroeder and Foley 1995), the Indian River Lagoon System, Florida (Ehrhart 1983), and the Atlantic Ocean off Florida from Brevard through Broward Counties (Wershoven and Wershoven 1992, Guseman and Ehrhart 1990). Adults of both sexes are presumed to migrate between nesting and foraging habitats along corridors adjacent to coastlines and reefs.

Status and Trends within the Southeastern United States

Green Turtle Nesting Assemblages within the Southeast Region

The vast majority of green turtle nesting within the Southeast Region occurs in Florida where green turtle nesting has been extensively and consistently surveyed during the period 1989-1999. In Florida during the 11-year period, green turtle abundance from nest counts ranges 109-1,389 nesting females per year

(Meylan *et al.,* 1995 and Florida Marine Research Institute Statewide Nesting Database, unpublished data; estimates assume 4 nests per female per year, Johnson and Ehrhart 1994). High biennial variation and a predominant two-year re-migration interval (Witherington and Ehrhart 1989a, Johnson and Ehrhart 1994) warrant combining even and odd years into two-year cohorts. This gives an estimate of total nesting females that ranges 705-1,509 during the period 1990-1999. It is important to note that because methodological limitations make the clutch frequency number (4 nests/female/year) an under-estimate (by as great as 50%), a more conservative range for numbers of green turtles nesting in Florida is 470-1,509 nesting females between 1990 and 1999.

In Florida during the period 1989-1999, numbers of green turtle nests by year show no trend ($n = 11, r^2 = 0.055, p = 0.49$). However, odd-even year cohorts of nests (as described and as justified above) did show a significant increase ($n = 5, r^2 = 0.72, p = 0.033$) during the period 1990-1999 (Florida Marine Research Institute, Index Nesting Beach Survey Database).

It is unclear how greatly green turtle nesting in the whole of Florida has been reduced from historical levels (Dodd 1981), although one account indicates that nesting in Florida's Dry Tortugas may now be only a small fraction of what it once was (Audubon 1926). Total nest counts and trends at index beach sites during the past decade suggest that green turtles that nest within the Southeast Region are recovering and have only recently reached a level of approximately 1,000 nesting females.

Benthic Foraging Green Turtles within the Southeast Region

There are no reliable estimates of the number of green turtles inhabiting foraging areas within the Southeast Region and it is likely that green turtles foraging in the region come from multiple genetic stocks. Maximum likelihood analyses of mitochondrial DNA haplotype frequencies (D. Bagley and L. Ehrhart, unpublished data) show that immature green turtles captured from three sites on the Atlantic coast of Florida originated from at least five distinct nesting assemblages that are distributed throughout the Atlantic Ocean Basin. In these immature green turtles, the greatest proportion of haplotypes from known nesting assemblages (92%-97%) came from either a Florida and Yucatan mixed stock or from a Tortuguero, Costa Rica, stock.

Trends in numbers of foraging green turtles within the region are also uncertain because of a lack of data. However, there is one sampling area in the region with a large time series of constant turtle-capture effort that may represent trends for a limited area within the region. This sampling area is at an intake canal for a power plant on the Atlantic coast of Florida where 2,578 green turtles have been captured during the period 1977-1999 (FPL 2000, M. Bresette, unpublished data). At the power plant, the annual number of immature green turtle captures (minimum straight-line carapace length < 85 cm) has increased significantly during the 23 year period ($r^2 = 0.42, p < 0.001$).

Status of immature green turtles foraging in the Southeast Region might also be assessed from trends at nesting beaches where many of the turtles originated, principally, Florida, Yucatan, and Tortuguero. Trends at Florida beaches are presented above. Trends in green turtle nesting at Yucatan beaches cannot be assessed because of irregularity in beach survey methods over time. Trends at Tortuguero (ca. 20,000-50,000 nests/year) show a significant increase in nesting during the period 1971-1996 (Bjorndal *et al.*, 1999).

Threats to Green turtles within the Southeastern United States

Threatened Destruction, Modification, or Curtailment of Habitat

Significant threats on green turtle nesting beaches in the region include beach armoring, erosion control, artificial lighting, and disturbance. Armoring of beaches (seawalls, revetments, rip-rap, sandbags, sand fences) in Florida, meant to protect developed property, is increasing and has been shown to discourage nesting even when armoring structures do not completely block access to nesting habitat (Mosier 1998). Alternatives to beach armoring include beach nourishment (artificially replacing beach sand lost to erosion). Most beach nourishment activities in the region take place outside the nesting/hatching season and are not likely to directly destroy nests. However, poor quality beach fill on nourished beaches does affect the ability of turtles to nest (Crain *et al.*, 1995, Raymond 1984) and may affect egg survivorship (Ackerman 1980).

Light pollution is an additional problem associated with human development on nesting beaches. Sea turtle hatchlings emerge from nests principally at night and become misdirected by artificial lighting, resulting in substantial mortality (Witherington 1997, 2000). In addition, adult green turtles are discouraged from nesting where artificial lighting is present (Witherington 1992). Other significant impacts on nesting beach habitat include egg mortality and disturbances to nesting females from foot, domestic animal, and vehicular traffic (Mann 1977, Witherington 1999). Barriers produced by exotic vegetation also reduce the suitability of nesting beaches (Davis and Whiting 1977). The severity of problems caused by coastal development and human access to the beach can be expected to increase with time.

Green turtles depend on shallow foraging grounds with sufficient benthic vegetation. Direct destruction of foraging areas due to dredging, boat anchorage, deposition of spoil, and siltation (Coston-Clements and Hoss 1983, Williams 1988) may have considerable effects on the distribution of foraging green turtles. Eutrophication, heavy metals, radioactive elements, and hydrocarbons all may reduce the extent, quality, and productivity of foraging grounds (Frazier 1980).

Pollution also threatens the pelagic habitat of young green turtles. The pelagic drift lines that young green turtles inhabit tend to collect floating debris such as plastics, oil, and tar (Carr 1987, Witham 1978). Contact with oil and the ingestion of plastics and tar are known to kill young sea turtles (Carr 1987). Older juvenile green turtles have also been found dead after ingesting seaborne plastics (Balazs 1985). A major threat from man-made debris is the entanglement of turtles in discarded monofilament fishing line and abandoned netting (Balazs 1985).

Over-Utilization

The principal cause of past declines and extirpations of green turtle assemblages has been the over-exploitation of green turtles as food and other products. The over-harvesting of individuals that are of high reproductive value (namely, large immatures and adults) has been implicated in the extirpation of nesting green turtles at Bermuda, Grand Cayman, Israel, Hong Kong, Mauritius, and Reunion (Groombridge and Luxmoore 1989, King 1982, National Research Council 1990). Adult and immature green turtles are utilized for meat, calipee (from which green turtle soup is made), leather, oil, and cosmetics, and are stuffed whole as curios. Green turtle eggs are prized as food and are eaten as aphrodisiacs (Parsons 1962).

Although intentional take of green turtles and their eggs is not extensive within the NMFS Southeast

Region, green turtles that nest and forage in the region may spend large portions of their life history outside the region and outside United States jurisdiction. Adult green turtles and immatures are exploited heavily on foraging grounds off Nicaragua and to a lesser extent off Colombia, Mexico, Panama, Venezuela, and the Tortuguero nesting beach (Carr *et al.,* 1978, Nietschmann 1982, Bass *et al.,* 1998, Lagueux 1998).

Disease and Predation

The occurrence of green turtle fibropapillomatosis (GTFP) disease was originally reported in the 1930s, when it was thought to be rare (Smith and Coates 1938). Presently, this disease is cosmopolitan and has been found to affect large numbers of animals in some areas, including Hawaii and Florida (Herbst 1994, Jacobson 1990, Jacobson *et al.,* 1991). GTFP is characterized by cutaneous growths (fibropapillomas) as large as 25 cm and visceral fibromas in some afflicted turtles. The growths are commonly found in the eyes, occluding sight, are often entangled in debris, and are frequently infected secondarily. The mortality rate among green turtles with fibropapilloma disease is not known. Other significantly debilitating diseases are relatively rare in wild green turtles (see the review by Herbst and Jacobson 1995).

Predation on sea turtles by animals other than humans occurs principally during the egg and hatchling stage of development (Stancyk 1982). Mortality due to predation of early stages appears to be relatively high naturally, and the reproductive strategy of the animal is structured to compensate for this loss (Bjorndal 1980). Some additional predation pressures on nesting beaches have occurred due to the introduction of domesticated and feral animals (Stancyk 1982). Predation of hatchlings at sea may be high (Gyuris 1994, Stancyk 1982, Witherington and Salmon 1992); however, few data are available. Hatchling sea turtles on land and in the water that are attracted to artificial light sources may suffer increased predation proportional to the increased time spent on the beach and in the predator-rich nearshore zone (Witherington 2000).

Other Threats Incidental to Human Activity

Green turtles are often captured and drowned in nets set to catch fishes. Gillnets, trawl nets, pound nets (Crouse 1982, Hillestad *et al.,* 1982, National Research Council 1990) and abandoned nets of many types (Balazs 1985, Ehrhart *et al.,* 1990) are known to catch and kill sea turtles. Green turtles also are taken by hook and line fishing. Collisions with power boats and encounters with suction dredges have killed green turtles along the United States coast and may be common elsewhere where boating and dredging activities are frequent (Florida Marine Research Institute, Sea Turtle Stranding and Salvage Network Database).

Threats from Natural Phenomena

Natural disturbances such as hurricanes can cause significant destruction of nesting beaches. At Aves Island, Venezuela, the nesting area was severely eroded and all eggs present were destroyed by the passage of Hurricane David in 1979 (Pritchard 1980). Smaller storms are also known to cause considerable loss of sea turtle eggs on nesting beaches (Ross and Barwani 1982, Witherington 1986). This density-independent mortality may be relatively inconsequential for a large stable population but may significantly threaten a depleted one. The presence of human development, and particularly beach armoring, can magnify the damage to nesting beaches by storms.

Hypothermic stunning and mortality are known to affect hundreds of green turtles during regular episodes of cold weather (Witherington and Ehrhart 1989b). These episodes are especially common in the northern Indian River Lagoon System of Florida.

Hawksbill Turtles *(Eretmochelys imbricata)*

Status and Trends

The hawksbill turtle is listed as endangered under the United States Endangered Species Act (1973), and is considered critically endangered by the International Union for the Conservation of Nature (IUCN) based on global population declines of over 80% during the last three generat.ons (105 years) (Meylan and Donnelly 1999). Only five regional nesting populations remain with more than 1,000 females nesting annually (Seychelles, Mexico, Indonesia, and two in Australia) (Meylan and Donnelly 1999). Most populations are declining, depleted, or remnants of larger aggregations. Although hawksbills are subject to the suite of threats that affect other marine turtles, the decline of the species is primarily attributed to centuries of exploitation for tortoiseshell, the beautifully patterned scales that cover the turtle's shell (Parsons 1972). Imports from 1970 to 1986 by Japan, the world's principal market, represented the shell of more than 600,000 adult turtles (Milliken and Tokunaga 1987). International trade in tortoiseshell is now prohibited among all signatories of the Convention on International Trade in Endangered Species, but some illegal trade continues, as does trade between non-signatories. Domestic trade in tortoiseshell, which is not subject to the Convention, is significant in many countries around the world.

In the western Atlantic, the largest hawksbill nesting population occurs in the Yucatán Península of Mexico, where several thousand nests are recorded annually in the states of Campeche, Yucatán, and Quintana Roo (Garduño-Andrade *et al.*, 1999). Important but significantly smaller nesting aggregations are documented elsewhere in the region in Puerto Rico, the U.S. Virgin Islands, Antigua, Barbados, Costa Rica, Cuba, and Jamaica (Meylan, 1999a). Estimates of the annual number of nests for each of these areas are of the order of hundreds to a few thousand. Nesting within the southeastern United States and U.S. Caribbean is restricted to Puerto Rico (>650 nests/yr), the U.S. Virgin Islands (~400 nests/yr), and, rarely, Florida (0-4 nests/yr) (Eckert, 1995; Meylan, 1999a; Florida Statewide Nesting Beach Survey database). At the two principal nesting beaches in the U.S. Caribbean where long-term monitoring has been carried out, populations appear to be increasing (Mona Island, Puerto Rico) or stable (Buck Island Reef National Monument, St. Croix, USVI) (Meylan 1999a).

Biology

The hawksbill is a medium-sized sea turtle with adults in the Caribbean ranging in size from approximately 62.5 to 94.0 cm straight carapace length. The species occurs in all ocean basins although it is relatively rare in the eastern Atlantic and eastern Pacific, and absent from the Mediterranean Sea. Hawksbills are the most tropical of the marine turtles, ranging from approximately 30°N to 30° S. They are closely associated with coral reefs and other hard-bottom habitats, but they are also found in other habitats including inlets, bays, and coastal lagoons. The diet is highly specialized and consists primarily of sponges (Meylan 1988) although other food items, notably corallimorphs and zooanthids, have been documented to be important in some areas of the Caribbean (van Dam and Diez 1997; Mayor *et al.* 1998; Leon and Diez 2000).

The life history of hawksbills consists of a pelagic stage that lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988; Meylan, in prep.), followed by residency in developmental habitats (foraging areas where immatures reside and grow) in coastal waters. Adult foraging habitat, which may or may not overlap with developmental habitat, is typically coral reefs, although other hard-bottom communities and occasionally mangrove-fringed bays may be occupied. Hawksbills show fidelity to their foraging areas over periods of time as great as several years (van Dam and Diez 1998).

Hawksbills may undertake developmental migrations (migrations as immatures) and reproductive migrations that involve travel over hundreds or thousands of kilometers (Meylan 1999b). Reproductive females undertake periodic (usually non-annual) migrations to their natal beach to nest. Movements of reproductive males are less well known, but are presumed to involve migrations to the nesting beach or to courtship stations along the migratory corridor. Females nest an average of 3-5 times per season with some geographic variation in this parameter (see references on pp. 204-205, Meylan and Donnelly 1999; Richardson *et al.*, 1999). Clutch size is higher on average (up to 250 eggs) than that of green turtles (Hirth 1980). Reproductive females may exhibit a high degree of fidelity to their nest sites. This, plus the tendency of hawksbills to nest at regular intervals within a season, make them vulnerable to capture on the nesting beach.

Genetic studies indicate that a natal homing mechanism predominates for reproductive females and that nesting populations should be treated as separate stocks (Bass *et al.* 1996; Bass 1999). Feeding grounds typically are occupied by turtles from multiple nesting populations (Bowen *et al.* 1996; Bass 1999).

Hawksbills are threatened by all the factors that threaten other marine turtles, including exploitation for meat, eggs, and the curio trade, loss or degradation of nesting and foraging habitats, increased human presence, nest depredation, oil pollution, incidental capture in fishing gear, ingestion of and entanglement in marine debris, and boat collisions (Lutcavage *et al.* 1997; Meylan and Ehrenfeld 2000). The relative importance of these factors varies geographically, and differentially affects the various life history stages. In the United States, much of what we know about mortality factors affecting each species has been gathered by the Sea Turtle Stranding and Salvage Network.

Distribution, Abundance, and Threats along the United States Gulf Coast (Texas to Florida Bay)

Texas is the only state in the continental United States other than Florida where hawksbills occur on any regular basis. Nesting is extremely rare (one nest was recorded at Padre Island in 1998 [Mays and Shaver, 1998]) but pelagic-size individuals and small juveniles are not uncommon and are believed to be animals dispersing from nesting beaches in the Yucatán Peninsula of Mexico and farther south in the Caribbean (Amos 1989). Hawksbills comprised 5.2% of all strandings recorded along the Texas coast from 1980-1994; nearly all hawksbill strandings occurred on ocean-facing beaches or in Gulf waters (Shaver 1998). Amos (1989) reported that in contrast to strandings of other species, many of the strandings in Texas involved live animals less than 10 cm in carapace length. Strandings from 1972-1989 were concentrated at Port Aransas, Mustang Island, and near the headquarters of the Padre Island National Seashore (Amos 1989). Live hawksbills are sometimes seen along the jetties at Aransas Pass Inlet. Other live sightings include a 24.7-cm juvenile captured in a net at Mansfield Channel in May 1991 (Shaver 1994), and periodic sightings of immature animals in the Flower Gardens National Marine Sanctuary, particularly at Stetson Bank (E. Hickerson, pers. comm.).

Elsewhere along the northern Gulf of Mexico, live hawksbills are rarely recorded. A 75-cm hawksbill was reported captured in a purse seine two miles off Holly Beach, Louisiana (Rester and Condrey, 1996), but the photograph provided suggests that it was a misidentified loggerhead (Meylan, in prep.). There is also a report of a hawksbill captured in a gillnet in Cameron Parish, Louisiana (Dundee and Rossman, 1989). Hawksbills are described as occasional visitors to the Alabama coast.

Along the Gulf coast of Florida, only one hawksbill nest has been reported. This was at Longboat Key, Manatee County, on 19 May 1980 (Meylan, in prep.). No voucher specimens or photographs exist for this record. All strandings of hawksbills on the Gulf coast of Florida have occurred along the southern half of the coast, south from Pasco County (Florida Sea Turtle Stranding and Salvage Network database). No hawksbills were reported among a sample of over 400 sea turtles cold-stunned in St. Joseph Bay (Gulf County) in January 2001 (Summers *et al.*, in press), nor have they been reported from in-water capture studies in the Cedar Keys area (Levy County). However, a museum specimen documents the occurrence of a 45.6 cm hawksbill at Yankeetown, also in Levy County. A 21.6 cm hawksbill was found alive but entrapped in the Crystal River nuclear power plant in November 2000 (Florida Sea Turtle Stranding and Salvage Network).

Most of the hawksbills that strand on Florida's west coast are immature, but very few are pelagic-size, suggesting that pelagic-size turtles dispersing south out of the Gulf on the currents do so at some distance from the shore or else are not subject to much mortality (Meylan, in prep.). Pinellas County, including Tampa Bay, has the largest share of west coast hawksbill strandings. It is likely that immature hawksbills utilize the various hard-bottom habitats off the west coast as developmental habitat (Meylan, in prep.).

A single hawksbill was captured in the Ten Thousand Islands (Collier County) as part of an in-water capture program (Witzell and Schmid, in press). Hawksbills appear to be rare in Florida Bay (Monroe County); only two immature hawksbills have been recorded during extensive in-water sampling there (B. Schroeder, pers. comm.).

Threats to hawksbills along the Gulf coast of the United States are marine pollution (especially oil), entanglement in marine debris, degradation of foraging habitats, and boat-related injuries.

Distribution, Abundance, and Threats along the United States Atlantic Coast (Florida Keys to Virginia)

The Atlantic coast of Florida is the only area in the United States where hawksbills nest on a regular basis, but four is the maximum number of nests documented in any year during 1979-2000 (Florida Statewide Nesting Beach Survey database). Nesting occurs as far north as Volusia County, Florida, and south to the Florida Keys, including Boca Grande and the Marquesas. Soldier Key in Miami-Dade County has had more nests than any other location, and it is one of the few places in Florida that are mentioned in the historical literature as being a nesting site for hawksbills (DeSola 1935). There is also a report of a nest in the late 1970s at nearby Cape Florida. It is likely that some hawksbill nesting in Florida goes undocumented due to the great similarity of the tracks of hawksbills and loggerheads. All documented records of hawksbill nesting from 1979 to 2000 took place between May and December except for one April nest in the Marquesas (Florida Statewide Nesting Survey database).

Long-term trends in hawksbill nesting in Florida are unknown, although there are a few historical reports of nesting in south Florida and the Keys (True 1884; Audubon 1926; DeSola 1935). DeSola (1931) stated that the Florida Keys were once the location of the finest fishery in the world for this species.

However, there are no specific records to substantiate this claim. No trend in nesting in Florida is evident from 1979 to 2000; between 0 and 4 nests are recorded annually.

Hawksbill strandings occur along the entire Atlantic coast but the majority are south of Cape Canaveral, particularly in Palm Beach, Broward and Miami-Dade Counties (Florida Sea Turtle Stranding and Salvage database). Most of the strandings in these counties are pelagic-size turtles. The abundance of hawksbills of this life history stage in southeast Florida may be linked to the close proximity of the Florida Current (Meylan, in prep.). These pelagic-stage hawksbills are presumably dispersing from nesting beaches in the Gulf and Caribbean. Strandings of pelagic-size hawksbills show a very high incidence of fouling with oil or tar, particularly in Palm Beach, Broward and Miami-Dade Counties.

Live juvenile to adult hawksbills have been recorded all along Florida's Atlantic coast, but nowhere in great numbers. They are not uncommon in the Florida Keys and on the reefs off Broward and Palm Beach Counties. Twenty-four hawksbills have been removed from the intake canal at the Florida Power and Light St. Lucie Plant in Juno Beach (St. Lucie County) during 1978-2000 (M. Bresette, pers. comm.). The animals ranged in size from 34.0 – 83.4 cm straight carapace length and were captured in most months of the year. Immature hawksbills have been recorded on rare occasions in both the Indian River Lagoon (Indian River County) and Mosquito Lagoon (Brevard County). A 24.8 cm hawksbill was captured on the worm reefs 200 meters off the coast in Indian River County (L. Ehrhart, pers. comm.).

Records of hawksbills north of Florida are relatively rare, although they exist as far north as Massachusetts. Pelagic-stage hawksbills dispersing from the Gulf of Mexico and southern Florida in the Gulfstream Current would be expected to occur offshore Georgia and the Carolinas. A pelagic-stage hawksbill was captured with a dipnet 37 nautical miles east of Sapelo Island, Georgia, on 31 May 1994 (Parker 1996). The turtle was floating at the surface in a dense mat of sargassum. An adult female hawksbill stranded on Cumberland Island in 1998, and a juvenile stranded on Jekyll Island the same year (Ruckdeschel *et al.* 2000). There is a record of a hawksbill captured in a pound net off Savannah in 1931. A small number of hawksbills have been recorded from North Carolina, including a 30-cm individual captured in a summer flounder trawl (Epperly *et al.* 1995a), another individual caught in a gillnet behind Hatteras Island in Pamlico Sound (Epperly *et al.* 1995b), and a third entrapped in a power plant in Southport, North Carolina (S. Epperly, pers. comm.). Schwartz (1976) mentions four hawksbills recorded near Beaufort Inlet (2) and Morehead City (2) in the 1970s.

One confirmed record of a hawksbill exists for the lower Chesapeake Bay in Virginia (Keinath and Musick 1991); another individual was stunned in Virginia by cold winter temperatures in December 2000 (Sea Turtle Stranding and Salvage Network database).

The primary threats to hawksbills along the Atlantic coast of the United States are fouling with petroleum products, capture on hooks or entanglement in monofilament line or other marine debris, loss or degradation of feeding habitats, and boat-related injuries. Reefs in the Florida Keys are threatened by pollution, siltation, damage from anchors, ship groundings, and other factors. Hawksbills are occasionally entrapped by the intake structure of power plants. The threat to hawksbills from disease is largely unknown. No substantiated records of Florida hawksbills with fibropapillomatosis exist, although several specimens that appeared to be hybrids between hawksbills and other species have had tumors (Meylan, in prep.).

Distribution, Abundance, and Threats in the United States Caribbean

The majority of hawksbills in U.S. waters occur in Puerto Rico and the U.S. Virgin Islands. Mona Island (Puerto Rico, 18° 05 N, 67°57 W) has 7.2 km of sandy beach that host the largest known hawksbill nesting aggregation in the Caribbean Basin, with over 500 nests recorded annually from 1998-2000 (Diez and van Dam, in press; Carlos Diez, pers. comm.). The island has been surveyed for marine turtle nesting activity for more than 20 years; surveys since 1994 show an increasing trend. Increases are attributed to nest protection efforts in Mona and fishing reduction in the Caribbean.

The coral reef habitat and cliffs around Mona Island and nearby Monito Island are an important feeding ground for all sizes of post-pelagic hawksbills. Genetic research has shown that this feeding population is not primarily composed of hawksbills that nest on Mona, but instead includes animals from at least six different nesting aggregations, particularly the U.S. Virgin Islands and the Yucatán Peninsula (Mexico) (Bowen *et al.*, 1996; Bass, 1999). Genetic data indicate that some hawksbills hatched at Mona utilize feeding grounds in waters of other countries, including Cuba and Mexico. Hawksbills in Mona waters appear to have limited home ranges and may be resident for several years (van Dam and Diez, 1998).

Mona Island is designated critical habitat for the hawksbill and it receives protection as a National Reserve under the administration of the Puerto Rico Department of Natural Resources and Environment. Limited poaching of eggs and females still occurs but the relative remoteness of the island from mainland Puerto Rico and the lack of any permanent inhabitants other than refuge staff confer considerable protection. Hog predation of nests requires continual maintence of fencing of nesting beaches. There is pressure on both nesting beaches and surrounding reef habitats from increased human presence, including visitors arriving via yachts. Although the island is currently a natural reserve, the threat of future development for tourism or other purpose always exists.

Hawksbill nesting occurs on mainland Puerto Rico at numerous sites, including Caja de Muertos, Humacao, Piñones, Fajardo, and Luquillo (Eckert 1995; Carlos Diez, pers. comm.). None of these has been systematically surveyed over a significant period, but nesting levels appear to be low. Nesting also occurs at low density on Culebra Island and Vieques Island (Eckert 1995). On Culebra, nesting is known to occur at Fanduca Beach, Jalovita Beach, Jalova Beach, Yellow Beach, Tamarindo Sur, Playa Brava, and Fossil Beach (USFWS Biological Opinion on naval excercises, July 27, 2000). An average of 2-7 nests were deposited annually on each of these beaches between 1991 and 1997. Historical literature suggests that nesting at Culebra and Vieques islands was once much more common (Wilcox 1904). Hawksbills commonly occur in feeding habitats around Culebra.

Threats to hawksbills on mainland Puerto Rico, Culebra, and Vieques are numerous and include degradation of nesting and foraging habitats, poaching, entanglement, oil, ingestion of marine debris, boat-related injuries, incidental catch, nest depredation, increased human presence, and illegal trade in tortoiseshell and stuffed juvenile hawksbills.

The U.S. Virgin Islands is also an important hawksbill nesting site. Buck Island Reef National Monument off St. Croix has been surveyed for nesting activity since 1987. Between 1987 and 1999, between 73 and 135 hawksbill nests have been recorded annually (Meylan and Donnelly 1999). The population, although small, is considered to be stationary. Females tagged while nesting on Buck Island have been found in Cuba and the Miskito Keys, Nicaragua (Meylan 1999b). Nesting beaches on Buck Island experience large-scale beach erosion and accretion as a result of hurricanes, and nests may be lost to erosion or burial. Predation of nests by mongoose is a serious problem and requires intensive trapping. The hawksbills that reside in waters around Buck Island have been the subject of ecological studies since

1994. Buck Island Reef National Monument was expanded in size in 2001 from 880 to 18,000 acres (Z. Starr-Hillis, pers. comm.)

Hawksbill nesting also occurs elsewhere on St. Croix, St. John and St. Thomas

During the 1994, 1995, and 1996 nesting seasons, 100, 78, and 84 hawksbill nests were recorded, respectively, at Sandy Point National Wildlife Refuge and the East End beaches (Jack's Bay, Isaac's Bay, and East End Bay) (Mackay and Rebholz 1997).

Juvenile and adult hawksbills are common in the waters of the U.S. Virgin Islands. Immature hawksbills tagged at St. Thomas during long-term, in-water studies appeared to be resident for extended periods (Boulon 1994). Tag returns were recorded from St. Lucia, the British Virgin Islands, Puerto Rico, St. Martin, and the Dominican Republic (Boulon 1989; Meylan 1999b).

Poaching of nesting females and eggs is still a problem in the U.S. Virgin Islands, as is vehicular driving, pollution (including sewage), boat-related injuries, degradation of nesting and foraging habitats, artificial lighting, entanglement, and illegal sale of stuffed juveniles and tortoiseshell (Eckert 1995).

III. Species Likely to Be Affected

Of the above species occurring in the Atlantic Ocean offshore of the southeastern United States, NMFS believes that the five sea turtle species are vulnerable to injury, and death from some of the activities associated with the proposed action. However, based on stranding records, hawksbill turtles are rare in this area; therefore, NMFS believes that although there is a chance that a hawksbill sea turtle could be affected by the proposed action, the chances of one of these species being adversely affected is unlikely, but not discountable.

IV. Environmental Baseline

This section contains an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, their habitat, and ecosystem, within the action area. The environmental baseline is a snapshot of a species' health at a specified point in time and includes state, tribal, local, and private actions already affecting the species, or that will occur contemporaneously with the consultation in progress. Unrelated Federal actions affecting the same species or critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are Federal and other actions within the action area that may benefit listed species or critical habitat.

The environmental baseline for this Opinion includes the effects of several activities that affect the survival and recovery of threatened and endangered species in the action area. The activities that shape the environmental baseline in the action area of this consultation are primarily fisheries and recovery activities associated with reducing fisheries impacts. Other environmental impacts include effects of discharges, dredging, military activities, oil and gas development activities, and industrial cooling water intake.

Status of the Species within the Action Area

The five species of sea turtles that occur in the action area are all highly migratory. NMFS believes that no individual members of any of the species are likely to be year-round residents of the action area. Individual animals will make migrations into nearshore waters as well as other areas of the North Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea. Therefore, the range-wide status of the five species of sea turtles, given in Section II above, most accurately reflects the species' status within the action area. Consequently the following discussion reflects conditions both inside and outside of the immediate action area, but most accurately reflects those factors within the action area.

Factors Affecting Species within the Action Area

Federal Actions

In recent years, NMFS has undertaken several ESA section 7 consultations to address the effects of federally-permitted fisheries and other Federal actions on threatened and endangered species in the action area. Each of those consultations sought to develop ways of reducing the probability of adverse effects of the action on sea turtles. Similarly, recovery actions NMFS has undertaken under the ESA are addressing the problem of take of sea turtles in the fishing and shipping industries. The following summary of anticipated incidental take of turtles includes only those Federal actions which have undergone formal section 7 consultation.

Vessel Operations

Potential adverse effects from Federal vessel operations in the action area of this consultation include operations of the Navy (USN) and Coast Guard (USCG), which maintain the largest Federal vessel fleets, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration (NOAA), and the Army Corps of Engineers (COE). NMFS has conducted formal consultations with the USCG, the USN (described below), and is currently in early phases of consultation with the other Federal agencies on their vessel operations. Through the section 7 process, where applicable, NMFS has and will continue to establish conservation measures for all these agency vessel operations to avoid or minimize adverse effects to listed species. At the present time, however, they represent potential for some level of interaction. Refer to the biological opinions for the USCG (NMFS 1995, 1996a, and 1998b) and the USN (NMFS 1997b) for detail on the scope of vessel operations for these agencies and conservation measures being implemented as standard operating procedures. Since the USN consultation only covered operations out of Mayport, Florida, potential still remains for USN vessels to adversely affect sea turtles when they are operating in other areas within the range of these species. Similarly, operations of vessels by other Federal agencies within the action area (NOAA, EPA, COE) may adversely affect sea turtles. However, the in-water activities of those agencies are limited in scope, as they operate a limited number of vessels or are engaged in research/operational activities that are unlikely to contribute a large amount of risk.

Additional military activities, including vessel operations and ordinance detonation, also affect sea turtles. U.S. Navy aerial bombing training in the ocean off the southeast U.S. coast, involving drops of live ordinance (500- and 1,000-lb bombs) is estimated to have the potential to injure or kill, annually, 84 loggerheads, 12 leatherbacks, and 12 greens or Kemp's ridley, in combination (NMFS 1997a). The USN will also conduct ship-shock testing for the new SEAWOLF submarine and the DDG-81 WINSTON S. CHURCHILL guided missile destroyer off the Atlantic coast of Florida, using 5 submerged detonations, each of 10,000-lb explosive charge. This testing is estimated to injure or kill 50 loggerheads, 6 leatherbacks, and 4 hawksbills, greens, or Kemp's ridleys, for the SEAWOLF and 8 sea turtles in any combination of the five species found in the action area for the WINSTON S. CHURCHILL (NMFS 1996b; NMFS 2000). The USN Mine Warfare Center in Corpus Christi, Texas, may take, annually, up to 5 loggerheads and 2 leatherbacks, hawksbills, greens, or Kemp's ridleys, in combination, during training activities in the western Gulf of Mexico. U.S. Air Force operations in the Eglin Gulf Test Range in the eastern Gulf of Mexico may also kill or injure sea turtles. Air-to-surface gunnery testing is estimated to kill a maximum of 3 loggerheads, 2 leatherbacks, and 1 green, hawksbill or Kemp's ridley. Search and rescue training operations are expected to have a low level of impacts, taking 2 turtles over a 20-year period. Operation of the USCG's boats and cutters in the U.S. Atlantic, meanwhile, is estimated to take no more than one individual turtle—of any species—per year (NMFS 1995). Formal consultation on overall USCG or USN activities in the Gulf of Mexico has not been conducted.

The construction and maintenance of Federal navigation channels has also been identified as a source of turtle mortality. Hopper dredges, which are frequently used in ocean bar channels and sometimes in harbor channels and offshore borrow areas, move relatively rapidly (compared to sea turtle swimming speeds) and can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower moving turtle. Along the Atlantic coast of the southeastern United States, NMFS estimates that annual, observed injury or mortality of sea turtles from hopper dredging may reach 35 loggerheads, 7 greens, 7 Kemp's ridleys, and 2 hawksbills (NMFS 1997c). A combination of hopper dredging and the use of explosives is expected to take 18 sea turtles (all species) during the deepening and widening of Wilmington Harbor, North Carolina. Along the north and west coasts of the Gulf of Mexico, channel maintenance dredging using a hopper dredge may injure or kill 30 loggerhead, 8 green, 14 Kemp's ridley, and 2 hawksbill sea turtles annually (NMFS 1997d). Also on the Texas coast of the Gulf of Mexico the widening of the Houston-Galveston Navigation Channels is expected to annually take 5 loggerhead, 5 Kemp's ridley, 2 green, and 1 hawksbill sea turtles. Additional incidental take statements for dredging of Charlotte Harbor and Tampa Bay, Florida, anticipate these projects may incidentally take, by injury or mortality, 2 loggerheads or 1 Kemp's ridley or 1 green or 1 hawksbill sea turtle for Charlotte Harbor and 8 sea turtles, including no more than 5 documented Kemp's ridley, hawksbill, leatherback, or green turtles, in any combination, for Tampa Bay.

The COE and Minerals Management Service (MMS) (the latter is nonmilitary) rig removal activities also adversely affect sea turtles. For the COE activities, an incidental take (by injury or mortality) of one documented Kemp's ridley, green, hawksbill, leatherback, or loggerhead turtle is anticipated under a rig removal consultation for the New Orleans District (NMFS 1998c). MMS activities are anticipated to result in annual incidental take (by injury or mortality) of 25 sea turtles, including no more than 5 Kemp's ridley, green, hawksbill, or leatherback turtles and no more than 10 loggerhead turtles, due to MMS' OCS oil and gas exploration, development, production, and abandonment activities.

Federal Fishery Operations

Adverse effects on threatened and endangered species from several types of fishing gear occur in the action area. Efforts to reduce the adverse effects of commercial fisheries are addressed through the ESA section 7 process. Gillnet, longline, trawl gear, and pot fisheries have all been documented as interacting with sea turtles. For all fisheries for which there is a Federal fishery management plan (FMP) or for which any Federal action is taken to manage that fishery, impacts have been evaluated under section 7.

Several formal consultations have been conducted on the following fisheries that NMFS has determined are likely to adversely affect threatened and endangered species: American Lobster, Monkfish, Dogfish, Southeastern Shrimp Trawl Fishery, Northeast Multispecies, Atlantic Pelagic Swordfish/Tuna/Shark, and Summer Flounder/Scup/Black Sea Bass fisheries. These consultations are summarized below; for more detailed information, refer to the respective biological opinions.

The *Northeast Multispecies Sink Gillnet Fishery* is one of the major fisheries that is known to take sea turtles. This fishery has historically occurred from the periphery of the Gulf of Maine to Rhode Island in water to 60 fathoms. In recent years, more of the effort in this fishery has occurred in offshore waters and into the mid-Atlantic. Participation in this fishery declined from 399 to 341 permit holders in 1993 and is expected to continue to decline as further groundfish conservation measures are implemented. The fishery operates throughout the year with peaks in the spring and from October through February. Data indicate that gear used in this fishery has seriously injured loggerhead and leatherback sea turtles. It is often difficult to assess gear found on stranded animals or observed at sea and assign it to a specific fishery. Only a fraction of the takes are observed, and the catch rate represented by the majority of takes, which are reported opportunistically, *i.e.*, not as part of a random sampling program, is unknown. Consequently, the total level of interaction cannot be determined through extrapolation. The incidental take level established for this fishery in the July 5, 1989, Opinion estimated that 10 documented Kemp's ridley, 10 green, 10 hawksbill, 10 leatherback, and 100 loggerhead sea turtles would be killed or injured by the fishery annually.

The monkfish and dogfish fisheries are prosecuted with multispecies-type gear, and therefore have potential to interact with sea turtles. After reviewing the best available information on the status of endangered and threatened species under NMFS jurisdiction, the environmental baseline for the action area, the effects of the action, and the cumulative effects, NMFS concluded in a biological opinion issued December 21, 1998, that conduct of the monkfish fishery, with modification to reduce impacts of entanglement through the whale and porpoise take reduction plans (TRPs), may adversely affect but is not likely to jeopardize the continued existence of endangered and threatened species under NMFS jurisdiction.

The *Monkfish Fishery Management Plan* was recently completed by the New England and Mid-Atlantic Fishery Management Councils. This fishery uses several gear types which may entangle protected species, and takes of shortnose sturgeon and sea turtles have been recorded from monkfish trips. NMFS completed a formal consultation on the Monkfish FMP on December 21, 1998, which concluded that the fishery, with modification under the TRPs, is not likely to jeopardize listed species or adversely modify critical habitat. The ITS provided under this Opinion anticipates up to 6 incidental takes of loggerhead turtles (no more than 3 lethal), 1 lethal or nonlethal take of a green sea turtle, 1 lethal or nonlethal take of a Kemp's ridley, and 1 lethal or nonlethal take of a leatherback. However, the implication of this fishery in the recent pulse of sea turtle strandings in North Carolina noted elsewhere in this Opinion necessitate reinitiation of consultation and likely the current incidental take levels will be revised in a new incidental take statement.

A consultation was recently concluded for *the Spiny Dogfish Fishery.* This fishery is similar to the monkfish fishery, but uses somewhat smaller mesh gear. The recent biological opinion prepared for the FMP for this fishery anticipates 6 takes (no more than 3 lethal) of loggerheads, and 1 take (lethal or nonlethal) each for Kemp's ridley, leatherbacks, and, green sea turtles.

The *Summer Flounder, Scup and Black Sea Bass fisheries* are known to interact with sea turtles. Significant measures have been developed to reduce the take of sea turtles in summer flounder trawls and trawls that meet the definition of a summer flounder trawl (which would include fisheries for other species like scup and black sea bass) by requiring TEDs in nets in the area of greatest bycatch off the North Carolina and southern Virginia coast. NMFS is considering a more geographically inclusive regulation to require TEDs in trawl fisheries that overlap with sea turtle distribution to reduce the impact from this fishery. Developmental work is also ongoing for a TED that will work in the flynets used in the weakfish fishery. The anticipated observed annual take rates for turtles in this multispecies fishery is 15 loggerheads and 3 leatherbacks, hawksbills, greens, or Kemp's ridleys, in combination annually (NMFS 1997a).

The *Atlantic Pelagic Fisheries for Swordfish, Tuna, Shark, and Billfish* are known to incidentally capture large numbers of turtles, particularly in the pelagic longline component (NMFS 2000). Take levels from hooking or entanglement in longline gear are estimated for 2000 at 468 loggerheads, 358 leatherbacks, 46 greens, 23 Kemp's ridleys, and 46 hawksbills, with a resulting mortality rate of approximately 30%. The interactions resulting from the shark gillnet, shark bottom longline, and other gears used in this fishery are lower. The shark gillnet component is estimated, based on limited observer data, to injure or kill 20 loggerheads, 2 leatherbacks, 2 Kemp's ridleys, 2 greens, and 2 hawksbills annually. The shark bottom longline component is similarly estimated, based on limited observer data, to injure or kill 12 loggerheads, 2 leatherbacks, 2 Kemp's ridleys, 2 greens, and 2 hawksbills annually. The other gears are anticipated to result in documented takes of no more than 3 turtles, in total, of any species.

The *Southeast United States Shrimp Fishery* is known to incidentally take high numbers of sea turtles. Shrimp trawlers in the southeastern United States are required to use TEDs, which reduce a trawler's capture rate by 97%. Even so, NMFS estimated that 4,100 turtles may be captured annually by shrimp trawling, including 650 leatherbacks that cannot be released through TEDs, 1,700 turtles taken in try nets, and 1,750 turtles that fail to escape through the TED (NMFS 1998d), including large loggerheads. Henwood and Stuntz (1987) reported that the mortality rate for trawl-caught turtles ranged between 21% and 38%, although Magnuson *et al.* (1990) suggested Henwood and Stuntz's estimates were very conservative and likely an underestimate of the true mortality rate.

Other Federal Actions

Sea turtles entering coastal or inshore areas have been affected by entrainment in the cooling-water systems of electrical generating plants. At the St. Lucie Nuclear Power Plant at Hutchinson Island, Florida, large numbers of green and loggerhead turtles have been captured in the seawater intake canal in the past several years. Annual capture levels from 1994-1997 have ranged from almost 200 to almost 700 green turtles and from about 150 to over 350 loggerheads. Almost all of the turtles are caught and released alive; NMFS estimates the survival rate at 98.5% or greater (see NMFS 1997f). A biological opinion completed in January 2000 estimates that the operations at the Brunswick Steam Electric Plant in Brunswick, North Carolina, may take 50 sea turtles in any combination annually, that are released alive. NMFS also estimated the total lethal take of turtles at this plant may reach 6 loggerhead, 2 Kemp's ridley or 3 green turtles annually. A biological opinion completed in June 1999 on the operations at the Crystal River Energy Complex in Crystal River, Florida, estimated the level of take of sea turtles in the plant's intake canal may reach 55 sea turtles with an estimated 50 being released alive biennially.

Environmental Contaminants

An extensive review of environmental contaminants in turtles has been conducted by Meyers-Schöne and

Walton (1994); however, most available information relates to freshwater species. High concentrations of chlorobiphenyls and organochlorine pesticides in the eggs of the freshwater snapping turtle, *Chelydra serpentina*, have been correlated with population effects such as decreased hatching success, increased hatchling deformities and disorientation (Bishop *et al.*, 1991, 1994). Very little is known about baseline levels and physiological effects of environmental contaminants on marine turtle populations (Witkowski and Frazier 1982; Bishop *et al.*, 1991). There are a few isolated studies on organic contaminants and trace metal accumulation in green and leatherback sea turtles (Davenport and Wrench 1990; Aguirre *et al.*, 1994). McKenzie *et al.* (1999) measured concentrations of chlorobiphenyls and organochlorine pesticides in marine turtles tissues collected from the Mediterranean (Cyprus, Greece) and European Atlantic waters (Scotland) between 1994 and 1996. Omnivorous loggerhead turtles had the highest organochlorine contaminant concentrations in all the tissues sampled, including those from green and leatherback turtles. It is thought that dietary preferences were likely to be the main differentiating factor among species. Decreasing lipid contaminant burdens with turtle size were observed in green turtles, most likely attributable to a change in diet with age. Sakai *et al.* (1995) found the presence of metal residues occurring in loggerhead turtle organs and eggs. More recently, Storelli *et al.* (1998) analyzed tissues from 12 loggerhead sea turtles stranded along the Adriatic Sea (Italy) and found that characteristically, mercury accumulates in sea turtle livers while cadmium accumulates in their kidneys, as has been reported for other marine organisms like dolphins, seals and porpoises by Law *et al.* (1991). Research is needed on the short- and long-term health and fecundity effects of chlorobiphenyl, organochlorine, and heavy metal accumulation in sea turtles.

State or Private Actions

Private and Commercial Vessels

Commercial traffic and recreational pursuits can have an adverse effect on sea turtles through prop and boat strike damage. Private vessels participate in high speed marine events concentrated in the southeastern United States and are a particular threat to sea turtles, and occasionally to marine mammals as well. The magnitude of these marine events is not currently known. NMFS and the USCG are in early consultation on these events, but a thorough analysis has not been completed. The STSSN also reports many records of vessel interaction (propeller injury) with sea turtles off coastal states such as New Jersey and Florida, where there are high levels of vessel traffic.

State Fishery Operations.

A biological opinion on the NMFS/ASMFC interjurisdictional FMP for weakfish was conducted in June 1997. Weakfish are caught in the summer flounder fishery and are also fished with fly nets. Analyses of the NMFS' observer data showed 36 incidental captures of sea turtles for trawl and gillnet vessels operating south of Cape May, New Jersey, from April 1994 through December 1996. Of those turtles taken, 28 loggerheads were taken in trawls that also caught weakfish, and resulted in two deaths. Most of the sea turtle takes occurred in late fall. In all cases, weakfish landings were second in poundage behind Atlantic croaker and summer flounder (NEFSC unpub. data).

The North Carolina observer program documented 33 fly net trips from November through April of 1991-1994 and recorded no turtles caught in 218 hours of trawl effort. However, a NMFS observed vessel fished for summer flounder for 27 tows with an otter trawl equipped with a TED and then fished for weakfish and Atlantic croaker with a fly net that was not equipped with a TED. They caught one loggerhead in 27 TED equipped tows and 7 loggerheads in nine fly net tows without TEDs. In addition, the same vessel using the fly net in a previous trip took 12 loggerheads in 11 out of 13 observed tows targeting Atlantic croaker. Weakfish landings from these fly net tows were second in poundage (NEFSC unpub. data).

Georgia and South Carolina prohibit gillnets for all but the shad fishery. This fishery was observed in South Carolina for one season by the NMFS Southeast Fisheries Science Center (McFee *et al.* 1996). No takes of protected species were observed. Florida has banned all but very small nets in state waters, as has the state of Texas. Louisiana, Mississippi, and Alabama have also placed restrictions on gillnet fisheries within state waters such that very little commercial gillnetting takes place in southeast waters, with the exception of North Carolina. Most pot fisheries in the southeast are prosecuted in areas frequented by sea turtles.

Pulses of greatly elevated sea turtle strandings occur with regularity in the mid-Atlantic area, particularly along North Carolina through southern Virginia in the late fall/early spring, coincident with their migrations. For example, in the last weeks of April through early May 2000, approximately 300 turtles, mostly loggerheads, stranded north of Oregon Inlet, North Carolina. Gillnets were found with four of the carcasses. These strandings are likely caused by state fisheries as well as Federal fisheries, although not any one fishery has been identified as the major cause. Fishing effort data indicate that fisheries targeting monkfish, dogfish, and bluefish were operating in the area of the strandings. Strandings in this area represent, at best, 7%-13% of the actual nearshore mortality (Epperly *et al.* 1996). Studies by Bass *et al.* (1998), Norrgard (1995), and Rankin-Baransky (1997) indicate that the percentage of northern loggerheads in this area is highly over-represented in the strandings when compared to the approximately 9% representation from this subpopulation in the overall United States sea turtle nesting populations. Specifically, the genetic composition of sea turtles in this area is 25%-54% from the northern subpopulation, 46%-64% from the South Florida subpopulation, and 3%-16% from the Yucatan subpopulation. The cumulative removal of these turtles on an annual basis would severely impact the recovery of this species.

Conservation and Recovery Actions Shaping the Environmental Baseline

NMFS implemented a series of regulations aimed at reducing potential for incidental mortality of sea turtles in commercial fisheries. In particular, NMFS has required the use of TEDs in southeast United States shrimp trawls since 1989 and in summer flounder trawls in the mid-Atlantic area (south of Cape Charles, Virginia) since 1992. It has been estimated that TEDs exclude 97% of the turtles caught in such trawls. These regulations have been refined over the years to ensure that TED effectiveness is maximized through proper placement and installation, configuration (*e.g.*, width of bar spacing), floatation, and more widespread use. Recent analyses by Epperly and Teas (1999) indicate that the minimum requirements for the escape opening dimensions are too small, and that as much as 47% of the loggerheads stranding annually along the Atlantic seaboard and Gulf of Mexico were too large to fit through existing openings. On October 2, 2001, NMFS published a proposed rule to require larger escape openings (66 FR 50148).

In 1993 (with a final rule implemented 1995), NMFS established a Leatherback Conservation Zone to restrict shrimp trawl activities from the coast of Cape Canaveral, Florida, to the North Carolina/Virginia border. This provides for short-term closures when high concentrations of normally pelagically distributed leatherbacks are recorded in more coastal waters where the shrimp fleet operates. This measure is necessary because, due to their size, adult leatherbacks are larger than the escape openings of most NMFS-approved TEDs. This rule was originally established because of coastal concentrations of leatherbacks which sometimes appear during their spring northward migration, but the rule was also recently implemented in the fall of 1999 off the coast of northern Florida due to unseasonable concentrations there, and leatherback TEDs were also required off the coast of Texas in the spring of 2000 due to high numbers of leatherback strandings there.

NMFS is also working to develop a TED which can be effectively used in a type of trawl known as a fly net, which is sometimes used in the mid-Atlantic and northeast fisheries to target sciaenids and bluefish. Limited observer data indicate that takes can be quite high in this fishery. A prototype design has been developed, but testing under commercial conditions is still necessary.

In addition, NMFS has been active in public outreach efforts to educate fishermen regarding sea turtle handling and resuscitation techniques. As well as making this information widely available to all fishermen, NMFS recently conducted a number of workshops with longline fishermen to discuss bycatch issues including protected species, and to educate them regarding handling and release guidelines. NMFS intends to continue these outreach efforts and hopes to reach all fishermen participating in the pelagic longline fishery over the next 1 to 2 years.

Sea Turtle Stranding and Salvage Network Activities

There is an extensive network of STSSN participants along the Atlantic and Gulf of Mexico which not only collects data on dead sea turtles, but also rescues and rehabilitates any live stranded turtles. In most states, the STSSN is coordinated by state wildlife agency staff, although some state stranding coordinators are associated with academic institutions. Data collected by the STSSN are used to monitor stranding levels and compare them with fishing activity in order to determine whether additional restrictions on fishing activities are needed. These data are also used to monitor incidence of disease, study toxicology and contaminants, and conduct genetic studies to determine population structure. All of the states that participate in the STSSN are collecting tissue for and/or conducting genetic and ageing studies to better understand the population dynamics of the small subpopulation of northern nesting loggerheads. These states also tag turtles as live ones are encountered (either via the stranding network through incidental takes or in-water studies). Tagging studies help provide an understanding of sea turtle movements, longevity, reproductive patterns, *etc.*

Other Potential Sources of Impacts in the Environmental Baseline

A number of activities that may indirectly affect listed species include discharges from wastewater systems, dredging, ocean dumping and disposal, and aquiculture. The impacts from these activities are difficult to measure. Where possible, however, conservation actions are being implemented to monitor or study impacts from these elusive sources. For example, extensive monitoring is being required for a major discharge in Massachusetts Bay (Massachusetts Water Resources Authority) in order to detect any changes in habitat parameters associated with this discharge. Close coordination is occurring through the section 7 process on both dredging and disposal sites to develop monitoring programs and ensure that vessel operators do not contribute to vessel-related impacts.

NMFS and the U.S. Navy have been working cooperatively to establish a policy for monitoring and managing acoustic impacts from anthropogenic sound sources in the marine environment. Acoustic impacts can include temporary or permanent injury, habitat exclusion, habituation, and disruption of other normal behavior patterns. It is expected that the policy on managing anthropogenic sound in the oceans will provide guidance for programs such as the use of acoustic deterrent devices in reducing marine mammal-fishery interactions and review of Federal activities and permits for research involving acoustic activities. The Office of Naval Research hosted a meeting in March 1997 to develop scientific and technical background for use in policy preparation. NMFS hosted a workshop in September 1998 to gather technical information which will support development of new acoustic criteria.

Summary and Synthesis of the Status of Species and Environmental Baseline

In summary, the potential foı dredging, military activities, fisheries, *etc*., to adversely affect sea turtles exists for the sea turtles considered in this consultation. However, recovery actions have been undertaken as described and continue to evolve. Those actions have started to produce positive changes in the nesting numbers of Kemp's ridley and loggerhead turtles (south Florida subpopulation) that are expected to continue. The other listed species are not likely to have benefitted to the same degree from the recovery actions taken. Green, leatherback, and hawksbill turtle nesting is mostly outside the United States and Mexico and likely has received less beachside protection efforts. Loggerheads and Kemp's ridleys are the major shrimp bycatch species that have benefitted the most from TED use. Still, those actions are expected to benefit the listed species in the foreseeable future. These actions should not only improve the conditions of sea turtles, but are expected to reduce sources of human-induced mortality as well.

However, factors in the existing baseline for loggerhead sea turtles and leatherback sea turtles leave cause for considerable concern regarding the status of these populations and the current impacts upon these populations:

a. The leatherback sea turtle is declining worldwide. Overall sources of mortality, including the highly migratory species fisheries, incurred by this population exceed the 1%-3 % sustainable level proposed by Spotila (2001).

b. The nesting numbers for the northern subpopulation of loggerhead sea turtles are stable or declining, and the nesting females currently number only about 3,700. The percent of northern loggerheads represented in sea turtle strandings in northern U.S. Atlantic states is over-representative of their total numbers in the overall loggerhead population. Current take levels from other sources, particularly fisheries (especially longline, trawl, and gillnet fisheries), are high.

V. Effects of the Action

Of the events permitted under the USCG's Marine Event Permitting Program, NMFS believes that only high speed marine events and fishing events are likely to adversely affect sea turtles. The other events are man-and wind-powered events (kayak and sailboat events) or slow moving boat parades and fireworks shows. Sea turtles are highly mobile and are expected to move out of the way of kayaks, sailboats, and slow moving boats involved in parades and fireworks events. Although many of the spectator vessels for these events are power vessels and can move at high rates of speed, the majority of these events take place nearshore where they are subject to speed limitations and no wake zones. As spectator vessels they are expected to remain in one place or move at the pace of the event; therefore, NMFS believes that the chances of a sea turtle being adversely affected by a slow speed marine event or one of the event's spectator vessels is discountable.

High speed events tend to be the most popular events with spectator vessel participation in these events ranging from 200 to 7,500 vessels per event. Many of these events take place offshore where there are no speed limitations; therefore, spectator vessels can travel to and from the event at high rates of speed, increasing their chances of impacting with a sea turtle. The events themselves can have between 35-150 participants and, including practice and qualifying, can last three days. NMFS believes that the mitigation measures the USCG imposes in their permits for these events for manatee and sea turtle protection will help limit but not eliminate sea turtle take as a result of these events. According to Florida Marine Research Institute (FRMI), of the 1,158 sea turtle strandings reported in Florida in 2000, 265 (22.9% of the total strandings) had evidence of boa. related injuries (*i.e.*, prop scars). Over the previous ten years, an average 20.4% of the stranded turtles in Florida showed evidence of boat related injuries. However, when spread out over the 878,939 registered vessels in Florida (FRMI Web site 2001) the number of known boat/turtle interactions is low.

High speed marine events will concentrate vessel activity (with between 200-7,500 spectators and between 35-150 participants) in one location, making it more difficult for sea turtles in the area to avoid these vessels and increasing the normally low chance of a boat/turtle interaction in the area. The USCG has not reported any boat/turtle interactions as a result of high speed marine events; however, this may be a factor of non-reporting of incidents by event officials, or not finding a dead or injured animals until days later (or not finding them at all), thereby not being able to prove the take was a result of the event. After a high speed event held in the summer of 2001 off the coast of Sarasota, Florida, a sea turtle was found dead with obvious damage from a collision with a boat; however, it could not be determined if the death of this turtle was caused as a direct result of the marine event. The fact that the majority of high speed events take place in the spring and summer (the same time when sea turtles concentrations are highest on the east coast of Florida) also increases these events' chances of a boat/turtle interaction. Therefore, NMFS believes that sea turtles will be adversely affected by high speed marine events, either by a collision with a spectator vessel or a participating vessel. These effects can range from injury to death. Although NMFS believes the factors mentioned above will increase the chance of sea turtle take, NMFS believes this take will be low due to the use of the mitigation measures issued as part of the USCG permit and the fact that turtles are highly mobile. NMFS anticipates a take by injury or mortality of two sea turtles over the next five years as a result of high speed marine events. Based on the life histories of the five species of sea turtles and their known populations in the action area , loggerhead and green sea turtles are the species that are most likely to be taken, followed by leatherbacks, Kemp's ridleys, and to a much lesser extent, hawksbills.

Recreational fishing has been known to take sea turtles. In 2000, in Florida, 75 turtles were reported entangled in fishing line or hooked in the mouth or body (FRMI Web site 2001). However, the majority of these incidents were thought to be caused by using fresh bait fished on the bottom or turtles interacting with discarded gear (Redlow, FRMI, pers. comm. 2001). The majority of permitted fishing tournaments target pelagic species such as dolphin and billfish. Fishing for these species takes place offshore, in deep water, and is done by trolling or in some cases actively casting and reeling in the bait. NMFS does not believe that sea turtles will be hooked by trolled bait; however, they may be caught by baits fished near structures or weed lines using the cast-and-reel method of fishing. Sea turtles may also be affected when the fishing vessels leave the tournament starting point heading for the fishing grounds. The concentration of these vessels traveling at high rates of speed from one area, as with the high speed events, will decrease a turtle's chance of avoiding participating vessels.

NMFS believes the possibility of hooking a turtle while fishing for pelagic species is low but not discountable; therefore, NMFS anticipates an incidental take of one turtle over the next five years as a result of permitted fishing activities. Based on the mitigative measures issued as part of the USCG's permits for fishing tournaments, NMFS believes this take will not be fatal. NMFS also believes that sea turtles will be adversely affected by the vessels traveling to and from the tournament starting point; however, these effects will be minimized because of the turtles' mobility and the fact that the boat owners that participate in these events tend to watch very carefully for anything floating in front of their boats (hitting something in the water can cause significant amounts of damage to these expensive boats) and may be able to avoid sea turtles. Therefore, NMFS anticipates an incidental take of one turtle as a result of vessels participating in a permitted fishing tournament traveling to and from the tournament starting point over the next five years. Based on the life histories of the five species of sea turtles and their known populations in the action area, loggerhead, green, and leatherback sea turtles are the species that are most likely to be taken, followed by Kemp's ridleys, and to a much lesser extent, hawksbills, as a result of activities associated with permitted fishing events.

VI. Cumulative Effects

Cumulative effects are the effects of future state, local, or private activities that are reasonably certain to occur within the action area considered in this Opinion. Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Within the action area, major future changes are not anticipated in the ongoing human activities described in the environmental baseline. The present, major human uses of the action area -- commercial and recreational fishing and recreational beach use and boating -- are expected to continue at the present levels of intensity in the near future. As discussed in Section III, however, listed species of turtles migrate throughout the Atlantic Ocean and Gulf of Mexico and may be affected during their life cycles by non-Federal activities outside the action area.

Beachfront development, lighting, and beach erosion control all are ongoing activities along the Atlantic and Gulf coasts. These activities potentially reduce or degrade sea turtle nesting habitats or interfere with hatchling movement to sea. Nocturnal human activities along nesting beaches may also discourage sea turtles from nesting sites. The extent to which these activities reduce sea turtle nesting and hatchling production is unknown. However, as conservation awareness spreads, more and more coastal cities and counties are adopting more stringent measures to protect hatchling sea turtles from the disorienting effects of beach lighting.

State-regulated commercial and recreational fishing activities in Atlantic Ocean and Gulf of Mexico waters currently result in the incidental take of threatened and endangered species. It is expected that states will continue to license/permit large vessel and thrill-craft operations which do not fall under the purview of a Federal agency, and issue regulations that will affect fishery activities. Any increase in recreational vessel activity in inshore and offshore waters of the Gulf of Mexico and Atlantic Ocean will likely increase the number of turtles taken by injury or mortality in vessel collisions. Recreational hook-and-line fisheries have been known to lethally take sea turtles. Future cooperation between NMFS and the states on these issues should help decrease take of sea turtles caused by recreational activities. NMFS will continue to work with coastal states to develop and refine ESA section 6 agreements and section 10 permits to enhance programs to quantify and mitigate these takes.

VII. Conclusion

After reviewing the current status of the endangered green, leatherback, hawksbill, and Kemp's ridley sea turtle and the threatened loggerhead sea turtle in the action area, the environmental baseline, the effects of the proposed action, and the cumulative effects, it is NMFS' biological opinion that the USCG Group Mayport and Group Miami's Marine Events Permitting Program is not likely to jeopardize the continued existence of the endangered green, leatherback, hawksbill, and Kemp's ridley sea turtles, or the threatened loggerhead sea turtle. No critical habitat has been designated for these species in the action area; therefore, none will be affected.

VIII. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the USCG so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. USCG has a continuing duty to regulate the activity covered by this incidental take statement. If USCG fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, USCG must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement.

Amount or Extent of Anticipated Take

Based on stranding records and historical data, five species of sea turtles are known to occur in the action area. Currently available information on the relationship between sea turtles, vessel use, and recreational fishing indicates that injury and/or death of sea turtles is likely to occur from collisions with vessels and interactions with fishing gear. Therefore, pursuant to section 7(b)(4) of the ESA, NMFS anticipates an **incidental take of up to 4 sea turtles in any combination of loggerhead, green, Kemp's ridley, hawksbill or leatherback over the next five years from the date of this Opinion. Of these, NMFS anticipates that 3 turtles in any combination of loggerhead, green, Kemp's ridley, hawksbill or leatherback may be killed as a result of the proposed action.** If the actual incidental captures or mortalities meet or exceed these levels, the USCG must immediately reinitiate formal consultation.

Effect of the Take

NMFS believes that the aforementioned level of anticipated take (lethal, or non-lethal) over the next five years is not likely to appreciably reduce either the survival or recovery of Kemp's ridley, green, loggerhead, leatherback, or hawksbill sea turtles in the wild by reducing their reproduction, numbers, or distribution. In particular, NMFS determined that it does not expect activities associated with the proposed action, when added to ongoing activities affecting these species in the action area and cumulative effects, to affect sea turtles in a way that reduces the number of animals born in a particular year (*i.e.*, a specific age-class), the reproductive success of adult sea turtles, or the number of young sea turtles that annually recruit into the adult breeding population.

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the Kemp's ridley, green, loggerhead, leatherback, and hawksbill sea turtles and to ensure no take of other species protected by the ESA under NMFS purview.

1. USCG shall continue to not permit high speed events during the months from November through March in the action area to ensure the safety of right and humpback whales.

2. USCG shall have mitigative measures in place for all marine events to limit potential interactions between protected species and event spectators and participants.

3. USCG shall have measures in place to monitor the proposed actions effects on protected species.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the USCG must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. The USCG shall continue to issue the sea turtle guidelines for high speed marine events (which are listed in the Proposed Action section of this Opinion) with every high speed marine event permit.

2. The USCG shall, where possible, incorporate in their marine event permits any manatee guidelines that are not currently part of the sea turtle guidelines for all high speed marine events permitted in the action area.

3. The USCG shall continue to issue safe fishing practice guidelines for sea turtles (listed in the Proposed Action section of this Opinion) with all fishing tournament permits.

4. The USCG shall record any sea turtle or marine mammal found in or around the area of a completed or ongoing permitted event that is injured or killed and shall report these findings to the respective stranding network. Injured or killed sea turtles shall be retrieved if possible.

5. Injured sea turtles shall be kept wet and in the shade and a qualified veterinarian shall be immediately notified and brought to the site. The USCG shall require the event's sponsor to pay any veterinary or rehabilitation costs resulting from the event.

6. In the event a marine mammal is injured or killed as a result of a USCG permitted event, the USCG shall aid to the extent possible the marine mammal stranding network representative in

their duties.

7. The USCG shall send a report detailing any turtle take to NMFS' Assistant Regional Administrator for Protected Resources, Southeast Regional Office, within 14 days of the incident (F/SER3, 9721 Executive Center Drive North, St. Peterburg, Florida 33702). This report will contain: the cause of the take, location, species, and final disposition of the turtle.

These reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The USCG must immediately initiate formal consultation, provide an explanation of the causes of the taking, and review the need for possible modification of the reasonable and prudent measures.

IX. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authority to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat to help implement recovery plans or to develop information.

(1) The USCG should work with event sponsors and NMFS to help develop guidelines better tailored to the specific marine event.

(2) The USCG should work to complete consultation on the marine event permitting programs of all USCG Groups in the southeast region of the United States (North Carolina to Texas).

X. Reinitiation of Consultation

This concludes formal consultation on the actions outlined in the proposed action section of this Opinion. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of taking specified in the incidental take statement is met or exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat (when designated) in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, the USCG must immediately request reinitiation of formal consultation.