



ECONOMIC ANALYSIS OF
CRITICAL HABITAT
DESIGNATION FOR EIGHT GULF
COAST MUSSEL SPECIES

Final Report | 24 May 2012

prepared for:

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LIST OF ACRONYMS AND ABBREVIATIONS

Act	Endangered Species Act
ADEM	Alabama Department of Environmental Management
ADOT	Alabama Department of Transportation
AFC	Alabama Forestry Commission
BER	Bureau of Emergency Response
BMPs	Best Management Practices
CEQA	California Environmental Quality Act
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DOD	U.S. Department of Defense
DOI	U.S. Department of the Interior
EA	Environmental Assessment
EPA	U.S Environmental Protection Agency
ERP	Environmental Resource Permit
EQIP	Environmental Quality Incentive Program
ESA	Endangered Species Act
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FERC	Federal Energy Regulatory Commission
FFA	Florida Forestry Association
FFS	Florida Forest Service
FWC	Florida Fish and Wildlife Conservation Commission

HCPs	Habitat Conservation Plans
HUC	Hydrologic Unit Code
INRMP	Integrated Natural Resource Management Plan
NAS	Naval Air Station
NOLF	Navy Outlying Landing Field
NPDES	National Pollution Discharge Elimination System
NFWFMD	Northwest Florida Water Management District
OAWs	Outstanding Alabama Waters
OFWs	Outstanding Florida Waters
OMB	U.S. Office of Management and Budget
OMBIL	Operations & Maintenance Business Information Link
ORM2	OMBIL Regulatory Module version 2
PUD	Planned Unit Development
RFA	Regulatory Flexibility Act
RHA	Rivers and Harbors Act
SBREFA	Small Business Regulatory Enforcement Fairness Act
Service	U.S. Fish and Wildlife Service
SHA	Strategic Habitat Area
TMDLs	Total Maximum Daily Loads
WHIP	Wildlife Habitat Incentive Program

EXECUTIVE SUMMARY

1. The purpose of this report is to evaluate the potential economic impacts associated with the designation of critical habitat for eight Gulf Coast mussel species. These species include five proposed to be listed as “endangered”—the Alabama pearlshell (*Margaritifera marrianae*), round ebonyshell (*Fusconaia rotulata*), southern sandshell (*Hamiota australis*), southern kidneyshell (*Ptychobranchus jonesi*), and Choctaw bean (*Villosa choctawensis*)—and three proposed to be listed as “threatened”—the tapered pigtoe (*Fusconaia burkei*), narrow pigtoe (*Fusconaia escambia*), and fuzzy pigtoe (*Pleurobema strodeanum*). This report was prepared by Industrial Economics, Incorporated (IEC), under contract to the U.S. Fish and Wildlife Service (Service). This information is intended to assist the Secretary of the U.S. Department of the Interior (DOI) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.¹
2. On October 4, 2011, the Service published a Proposed Rule proposing both the listing of these species as endangered or threatened, as described above, as well as critical habitat designation for each species under the Endangered Species Act (Act).² The proposed critical habitat designation includes nine units totaling approximately 1,495 miles of stream and river channels located in the Escambia, Yellow, and Choctawhatchee basins in Alabama and Florida, and small portions of the Mobile River basin in Alabama. As described in the Proposed Rule, each of the units is occupied by one or more of the eight mussel species.
3. This final economic analysis analyzes the proposed designation as described in the Proposed Rule. This analysis does not reflect changes to the proposed critical habitat designation made in the Final Rule. Consequently, description of the habitat designation in the Final Rule may differ from maps and figures presented in this analysis.³
4. This analysis first describes protections provided by Federal, State and local statutes and regulations that may affect proposed critical habitat areas, including the listing of the species under the Act. These protections are not generated by or affected by critical habitat designation for the eight mussels; they are “baseline” protections afforded the mussels regardless of the designation of critical habitat. Thus the analysis will not quantify the associated impacts, but will describe them qualitatively.

¹ 16 U.S.C. §1533(b)(2).

² 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

³ For a detailed description of the public comments received on the draft economic analysis and the associated responses, refer to the responses to public comment section of the Final Rule.

5. The discussion of the baseline protections for the mussels provides context for the evaluation of the economic impacts of critical habitat designation, which are the focus of this analysis. These “incremental” economic impacts are those that are not expected to occur absent the designation of critical habitat. This analysis considers both direct and indirect incremental costs. Indirect costs are those that may result from the influence of critical habitat designation on the decisions of regulators and decision-makers other than the Service (e.g., State agencies and land managers). Because the Service believes that the direct benefits of the Proposed Rule are best expressed in biological terms, this analysis does not quantify or monetize benefits. However, we provide a qualitative discussion of economic benefits at the end of this report.

OVERVIEW OF THE PROPOSED CRITICAL HABITAT

6. The eight mussels are freshwater mussels that generally live embedded in the bottom of rivers, streams, and other bodies of water. The primary constituent elements of critical habitat required by these species include: 1) geomorphically stable stream and river channels and banks; 2) stable substrates of sand or mixtures of sand with clay or gravel with low to moderate amounts of fine sediment and attached filamentous algae; (3) a hydrologic flow regime necessary to maintain benthic habitats where the species are found, and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for habitat maintenance, food availability, and spawning habitat for native fishes; (4) water quality, including temperature (not greater than 32°C), pH (between 6.0 and 8.5), oxygen content (not less than 5.0 mg/L), hardness, turbidity, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages; (5) the presence of fish hosts.⁴
7. The Service has proposed approximately 1,495 miles of stream and river channels for critical habitat designation for the mussels.⁵ The lateral extent of critical habitat extends to the ordinary high water line. Our analysis evaluates impacts of critical habitat designation on activities within or affecting the proposed critical habitat area. In order to capture the land and water use threats occurring outside of the proposed critical habitat that may affect the physical and biological features of critical habitat, we identify a broader study area for the analysis. Specifically, the study area includes all sixth level Hydrologic Unit Code (HUC) watersheds containing the stream and river channels proposed for critical habitat designation.

⁴ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁵ *Ibid.*

8. The study area is organized into ten “units” and corresponding HUCs, as shown in Exhibit ES-1, and occurs within southern Alabama and northwestern Florida. The study area is characterized by rural and largely undeveloped lands; only one major city is located in the area (Dothan, Alabama).⁶ However, the loss of habitat and degradation of water quality in these areas pose significant threats to the continued existence of the eight mussel species.⁷
9. Over 80 percent of the riparian lands along the streams proposed for critical habitat are privately-owned, with the remaining acres owned either by county, State, or Federal entities or a combination of government and private entities.⁸ The economic analysis considers land use and ownership in the broader HUC watershed boundaries of the proposed critical habitat areas. Within this study area, approximately 95 percent of the lands are privately owned.⁹ Approximately three percent are managed by Federal entities and two percent are managed by State entities, with the remaining lands (less than one percent total) categorized as private conservation lands or unknown.¹⁰

⁶ U.S. Census Bureau. State & County QuickFacts. Accessed at <http://quickfacts.census.gov/qfd/index.html> on December 27, 2011.

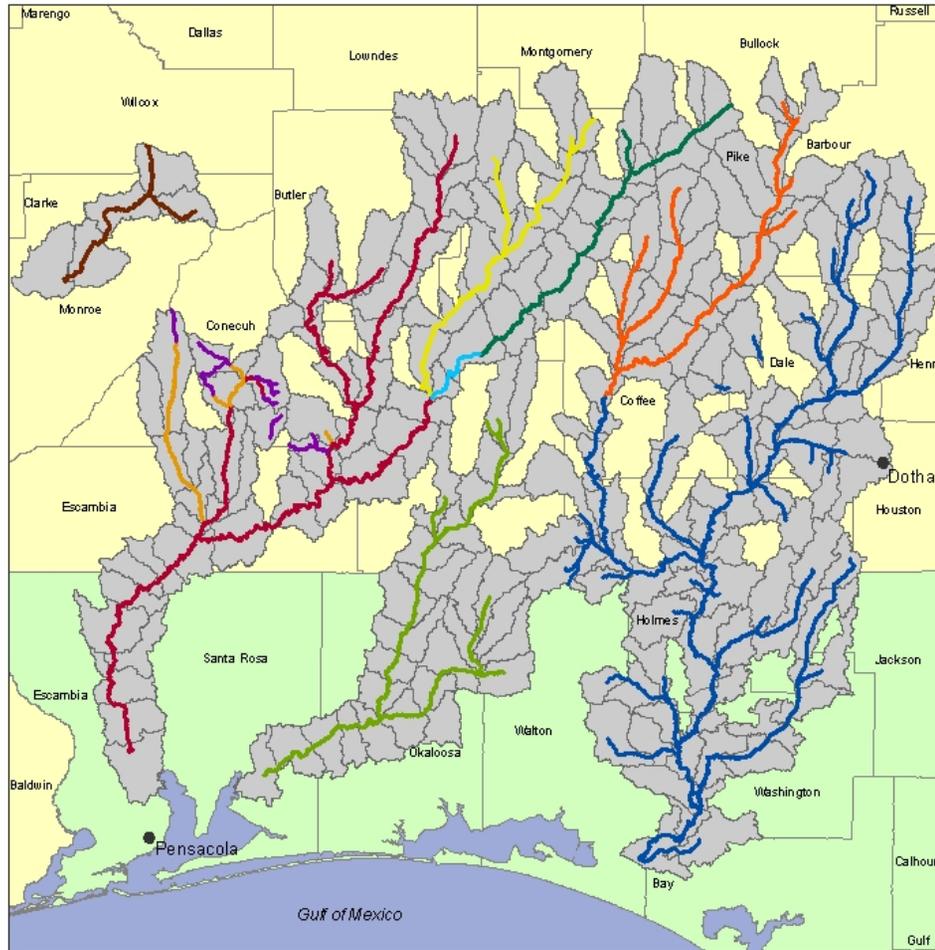
⁷ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁸ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁹ Protected Areas Database (PAD-US), CBI Edition 1.1.

¹⁰ *Ibid.*

EXHIBIT ES-1. OVERVIEW OF EIGHT MUSSELS PROPOSED CRITICAL HABITAT



8 Gulf Coast Mussels Proposed Critical Habitat

1:5,585,586

- AP 1
- AP 2
- GCM 1
- GCM 1/AP 2
- GCM 2
- GCM 3
- GCM 4
- GCM 5
- GCM 6
- GCM 7
- Study Area
- Alabama Counties
- Florida Counties



Source:
 1. US Fish and Wildlife Service, Field Office
 2. Environmental Systems Research Institute, Inc. (ESRI), Redlands, California, USA



10. Review of the Proposed Rule, consultation history, and existing conservation plans identified the following economic activities as potential threats to the eight mussel species and their habitat within the boundaries of proposed critical habitat. We therefore focus this analysis of potential impacts of mussel conservation on these activities.
- **Impoundments, dams, and diversions** represent potential threats to the species and their habitat because they alter, reduce, or eliminate river flow; block upstream and downstream movement of mussels and their host fish; increase turbidity and sedimentation; alter habitat quality; and alter water temperature and quality.
 - **Dredging, Channelization, and In-Stream Mining** represent potential threats to the species and their habitat. Disposal of dredged material into proposed critical habitat can alter or destroy substrate through direct, in-stream disturbance; increase turbidity and sedimentation; and alter, reduce, or eliminate river flow. In-stream gravel mining degrades water quality through sedimentation, alteration of stream hydrology, and direct, in-stream disturbance.
 - **Transportation and Utilities** projects degrade water quality, damage or remove riparian habitat, and alter stream hydrology. Specifically, road, bridge, and in-stream construction (for example, boat launch or dock construction) may cause sediments, nutrients, and contaminants to enter water bodies, and may degrade habitat through direct, in-stream disturbance. Activities categorized as ‘Utilities’ do not include hydropower activity.
 - **Residential and Commercial Development** represent potential threats to the species and their habitat through increased pollution from stormwater runoff; sedimentation from construction activity; and loss of riparian habitat and vegetation.
 - **Timber Management, Agriculture, and Grazing** degrade water quality through the removal of riparian vegetation, reduced bank stability, introduction of pesticides and fertilizers, increased sedimentation due to streambank trampling, altered peak flows and channel incisement, lower base flows, changes in channel morphology, and loss of nutrients within the stream channel.
 - **Oil Wells/Drilling** may degrade water quality through contaminant spills. More than 400 oil wells are located within Alabama’s Conecuh and Escambia Counties. The wells are subject to periodic spills either directly at the well site or as a result of transporting the oil. Numerous highways and railroads cross the stream channels, making spills as a result of transportation accidents another constant potential threat.

SUMMARY OF KEY FINDINGS

11. **The types of conservation efforts requested by the Service during section 7 consultation regarding the eight mussels are not expected to change due to critical habitat designation.** The Service believes that “in most cases, the results of consultation under the adverse modification and jeopardy standards are likely to be similar because... the primary constituent elements that define critical habitat are also essential for the

survival of the eight mussels.”¹¹ In addition, the Service anticipates that the conservation efforts it would recommend to avoid jeopardy to any one of the species would be the same conservation efforts it would recommend to avoid jeopardy or adverse modification of critical habitat for any of the other mussel species.¹² While none of the eight mussel species occur in every one of the nine units, every unit is occupied by at least one mussel species. Therefore, we anticipate that critical habitat designation will not generate additional requests for project modification in any of the proposed critical habitat units above and beyond those requested due to the presence of the species.

12. **Incremental impacts of critical habitat designation are limited to additional administrative costs of consultations.** Once critical habitat is designated, some additional effort is likely to be required as part of section 7 consultation to describe the potential for projects to result in adverse modification. This is reflected in additional hours spent in communication with the Service and on activities such as report-writing and project documentation.
13. **Indirect incremental impacts are unlikely to result from the designation of critical habitat for the mussels.** Based on discussions with State and local regulatory authorities, including Alabama Department of Environmental Management (ADEM), Florida Department of Environmental Protection (FDEP), and Northwest Florida Water Management District (NFWMD), land and water management practices are not expected to change due to the designation of critical habitat.¹³
14. The present value of total incremental cost of critical habitat designation is \$1.70 million over 20 years assuming a seven percent discount rate, or \$147,000 on an annualized basis.¹⁴ The distribution of projected incremental costs for each activity is provided in Exhibit ES-2. As highlighted in the exhibit, transportation and utility activities are likely to be subject to the greatest incremental impacts at \$1.15 million over 20 years, followed by water quality management activities at \$317,000; timber management, agriculture, and grazing activities at \$84,000; development at \$72,900; Department of Defense (DOD) land management activities at \$53,000; impoundments, dams, and diversions at \$13,100; and dredging, channelization, and in-stream mining at \$10,600 (present values over 20 years assuming a seven percent discount rate). No incremental impacts to oil wells or drilling operations are anticipated because there is no Federal nexus for these activities that would generate section 7 consultation.

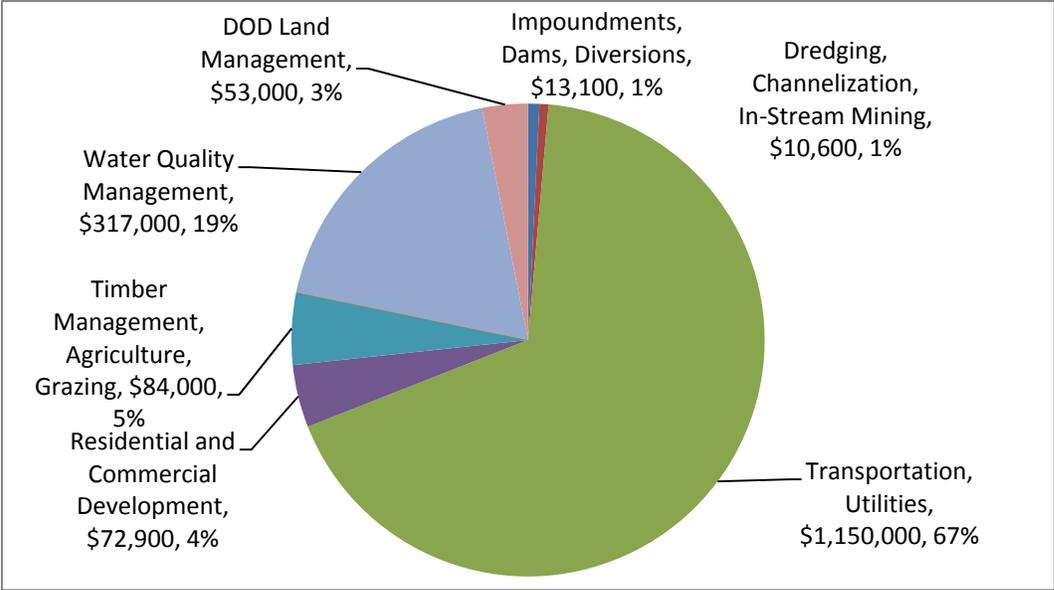
¹¹ US Fish and Wildlife Service, Incremental Effects Memorandum, July 15, 2011. See Appendix D.

¹² Email communication from the Service’s Atlanta, GA, Office to Industrial Economics, October 12, 2011.

¹³ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; Personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011; personal communication with the Northwest Florida Water Management District on December 14, 2011.

¹⁴ To calculate present value and annualized impacts, guidance provided by U.S. Office of Management and Budget (OMB) specifies the use of a real annual discount rate of seven percent. In addition, OMB recommends conducting a sensitivity analysis using other discount rates, such as three percent. Accordingly, all cost figures presented in Chapters 3 and 4 of this analysis describe present value cost impacts assuming a seven percent discount rate. Appendix B reports forecast impacts assuming a discount rate of three percent to highlight the sensitivity of results to the discount rate assumption.

EXHIBIT ES-2. ESTIMATED INCREMENTAL IMPACTS BY ECONOMIC ACTIVITY (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)



15. Because the incremental costs of the designation are administrative in nature, the proportion of total impacts likely to be experienced by each category of economic activity is driven by the number of anticipated projects in each category. The likely number of new development, grazing, farming, timber, or water management projects is small relative to the number of road and bridge construction and maintenance projects anticipated over the next 20 years. Specifically, 208 consultations are expected to occur in association with road and bridge maintenance and resurfacing projects. Conversations with the Alabama Department of Transportation (ADOT) and the Florida Department of Transportation (FDOT) indicate that road construction activity will result in consultation when roadways cross streams designated as critical habitat.¹⁵ In Alabama, GIS data were not available to determine the number of road crossings in critical habitat. Instead, ADOT identified all projects on roadways within the broader study area (including streams within the HUCs that are not explicitly proposed for critical habitat designation) using maps of their Five-Year Plan and maps of the proposed critical habitat. We therefore make the conservative assumption in Alabama that all projects on roadways within the broader study area (including streams within the HUCs that are not explicitly proposed for critical habitat designation) will result in section 7 consultation. This assumption likely results in an overestimate of impacts to transportation projects in Alabama. In Florida, on the other hand, GIS data were available, allowing for the analysis to identify

¹⁵ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

only planned or ongoing road construction projects that cross streams designated as critical habitat in Florida.

16. Exhibit ES-3 presents the estimated incremental impacts of eight mussels conservation over the next 20 years (2012 to 2031) by unit. The unit with the greatest impacts is Unit GCM6 (Choctawhatchee River and Lower Pea River Drainages in Walton, Washington, Bay, Holmes, and Jackson Counties, FL; and Geneva, Coffee, Dale, Houston, Henry, Pike, and Barbour Counties, AL); this unit is also the longest unit of all the proposed critical habitat units (total stream length).

EXHIBIT ES-3. TOTAL ESTIMATED INCREMENTAL IMPACTS BY UNIT (PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	20-YEAR IMPACTS (2012-2031)	
	PRESENT VALUE	ANNUALIZED
AP1	\$134,000	\$11,800
AP2	\$97,900	\$8,630
GCM1/AP2	\$28,800	\$2,540
GCM1	\$407,000	\$35,900
GCM2	\$7,140	\$630
GCM3	\$69,900	\$6,170
GCM4	\$39,000	\$3,440
GCM5	\$198,000	\$17,400
GCM6	\$670,000	\$59,100
GCM7	\$45,000	\$3,970
TOTAL	\$1,700,000	\$150,000
Notes: Estimates are rounded to three significant digits and may not sum to totals reported due to rounding.		

POTENTIAL IMPACTS TO SMALL ENTITIES

17. This analysis estimates that seven small governments (counties) may be affected by the rule. The affected counties represent 11 percent of small counties in Alabama and Florida. We anticipate approximately up to six counties could be affected each year, with an impact of approximately \$875 per county for consultations on impoundments, dams, and diversions. Assuming annual county tax revenues of at least \$1 million, per county impacts represent approximately 0.02 percent of annual revenues.
18. Approximately 20 small development-related entities are likely to incur administrative costs associated with section 7 consultations. Assuming that all of these entities are small, they represent less than one percent of all small developers and homebuilders in

the affected counties. Annualized impacts per entity are approximately \$47, which represents less than one percent of annual, per entity revenues.

19. Approximately four small dredging-related entities are likely to incur administrative costs associated with section 7 consultations. Assuming that all of these entities are small, they represent approximately four percent of all small heavy civil engineering and construction firms in the affected counties. Annualized impacts per entity are approximately \$48, which represents less than one percent of annual, per entity revenues.

ORGANIZATION OF REPORT

20. This report is organized into five chapters. Chapter 1 provides background on the proposed critical habitat rule. Chapter 2 discusses the framework employed in the analysis. Chapter 3 describes the baseline protections currently afforded the mussels and their habitat, and Chapter 4 discusses the potential incremental economic impacts of critical habitat designation for the mussels. Chapter 4 also provides a brief discussion of potential benefits of the designation. Finally, there are four appendices to this report: Appendix A discusses our small business and energy impacts analyses; Appendix B describes the sensitivity of results to discount rates; Appendix C presents undiscounted impacts by economic activity; and Appendix D provides information from the Service describing potential changes in conservation recommended for the species due to critical habitat designation.

CHAPTER 1 | INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

21. This chapter provides an overview of the proposed critical habitat for eight Gulf Coast mussel species. These species include five proposed to be listed as “endangered”—the Alabama pearlshell, round ebonyshell, southern sandshell, southern kidneyshell, and Choctaw bean—and three proposed to be listed as “threatened”—the tapered pigtoe, narrow pigtoe, and fuzzy pigtoe. This chapter also includes a summary of past legal actions that relate to the current proposal, a description of the area proposed for designation, and a discussion of threats to the proposed critical habitat. This information provides context for the analysis contained in Chapters 2, 3 and 4 of this report. All official definitions and proposed critical habitat boundaries are provided in the Proposed Rule.¹⁶
22. This final economic analysis analyzes the proposed designation as described in the Proposed Rule. This analysis does not reflect changes to the proposed critical habitat designation made in the Final Rule. Consequently, description of the habitat designation in the Final Rule may differ from maps and figures presented in this analysis.¹⁷

1.1.1 PREVIOUS FEDERAL ACTIONS

23. The eight mussels were first identified as candidates for protection under the Act in the May 4, 2004, Candidate Notice of Review.¹⁸ They were subsequently included in a listing petition filed by the Center for Biological Diversity on April 20, 2010.¹⁹ On October 4, 2011, the Service proposed to list the eight mussels and to designate critical habitat.²⁰ This economic analysis will inform the final critical habitat designation for the species.

1.1.2 PROPOSED CRITICAL HABITAT DESIGNATION

24. The Service proposes to designate approximately 1,495 miles of stream and river channels as critical habitat, located in Bay, Escambia, Holmes, Jackson, Okaloosa, Santa Rosa, Walton, and Washington Counties, Florida; and Barbour, Bullock, Butler, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Henry, Houston, Monroe, and

¹⁶ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

¹⁷ For a detailed description of the public comments received on the draft economic analysis and the associated responses, refer to the responses to public comment section of the Final Rule.

¹⁸ 2004 Notice of Review, 69 FR 24876.

¹⁹ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

²⁰ *Ibid.*

Pike Counties, Alabama.²¹ All units are known to be currently occupied by one or more of the eight mussels. Lands beneath navigable waters are owned by the States of Alabama and Florida, but lands beneath most nonnavigable waters proposed as critical habitat for the mussels are privately owned.²²

25. The lateral extent of proposed critical habitat extends to the ordinary high water line.²³ The Proposed Rule provides ownership information for the riparian lands along the waters; over 80 percent of these lands are privately-owned, with the remaining lands owned by county, State, or Federal entities or a combination of government and private entities.²⁴
26. Our analysis evaluates impacts of the critical habitat designation on activities within or affecting the proposed critical habitat area. In order to capture the land and water use threats occurring outside of the proposed critical habitat that may affect the physical and biological features of critical habitat, we identify a “study area” for the analysis, defined by all sixth level HUC watersheds containing the streams proposed for critical habitat designation. The Service anticipates that activities occurring within this study area may affect critical habitat for the mussels.^{25,26,27,28} Exhibit 1-1 depicts the stream and river reaches proposed for critical habitat as well as the surrounding HUC-6 watershed areas that constitute the study area for this analysis.
27. Exhibit 1-2 depicts land ownership in the study area and Exhibit 1-3 provides more information on the specific ownership categories. Within the study area, approximately 95 percent of the lands are privately owned.²⁹ Approximately 3 percent are managed by Federal entities and 2 percent are managed by State entities, with the remaining lands (<1 percent total) categorized as private conservation lands or unknown.³⁰

²¹ *Ibid.*

²² *Ibid.*

²³ *Ibid.*

²⁴ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

²⁵ Written communication with the Service on October 19, 2011.

²⁶ The U.S. Army-operated Fort Rucker Aviation Center, located in Daleville, AL, owns lands that include portions of the proposed critical habitat designation (specifically unit GCM6). In the Proposed Rule, the Service states that these lands are exempt from critical habitat designation under section 4(a)(3) of the Endangered Species Act, due to the fact that they are subject to the Fort Rucker Integrated Natural Resources Management Plan (INRMP), which the Service determined will provide a benefit to the mussels occurring in habitats within or downstream of the military reservation.

²⁷ As described in the Proposed Rule, Eglin Air Force Base (AFB), located in Niceville, FL, owns lands adjacent to the proposed critical habitat designation (specifically unit GCM5), but no portions of the stream or river channels proposed for critical habitat designation occur within the boundary of the military reservation and are therefore not proposed for exemption.

²⁸ The Department of the Navy’s Naval Air Station (NAS) Whiting Field complex includes two Navy Outlying Landing Fields (NOLFs) which fall within the study area for the proposed critical habitat designation, in Unit AP2 and Unit GCM1.

²⁹ Protected Areas Database (PAD-US), CBI Edition 1.1.

³⁰ *Ibid.*

EXHIBIT 1-1. OVERVIEW OF EIGHT MUSSELS PROPOSED CRITICAL HABITAT AND STUDY AREA FOR THE ECONOMIC ANALYSIS

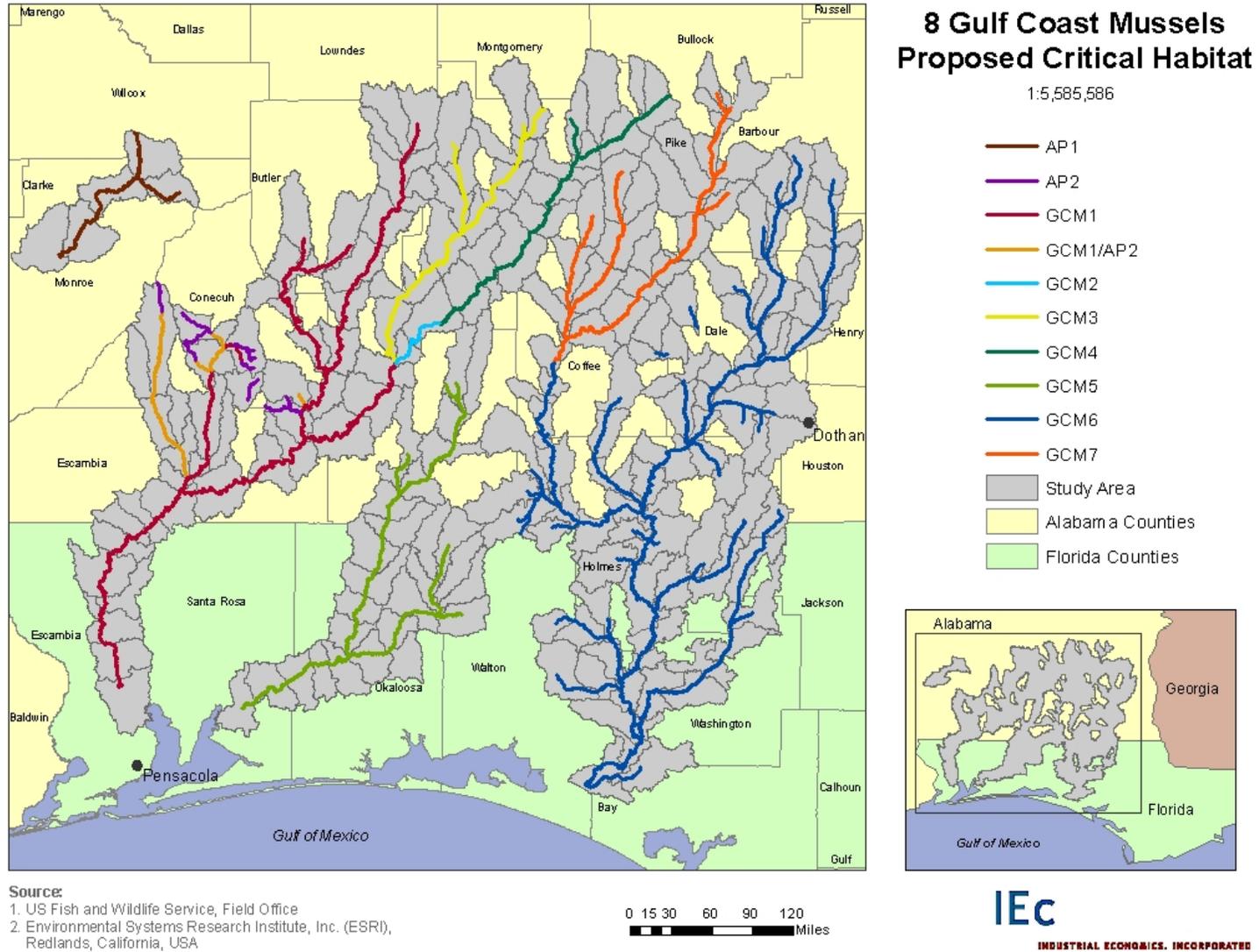
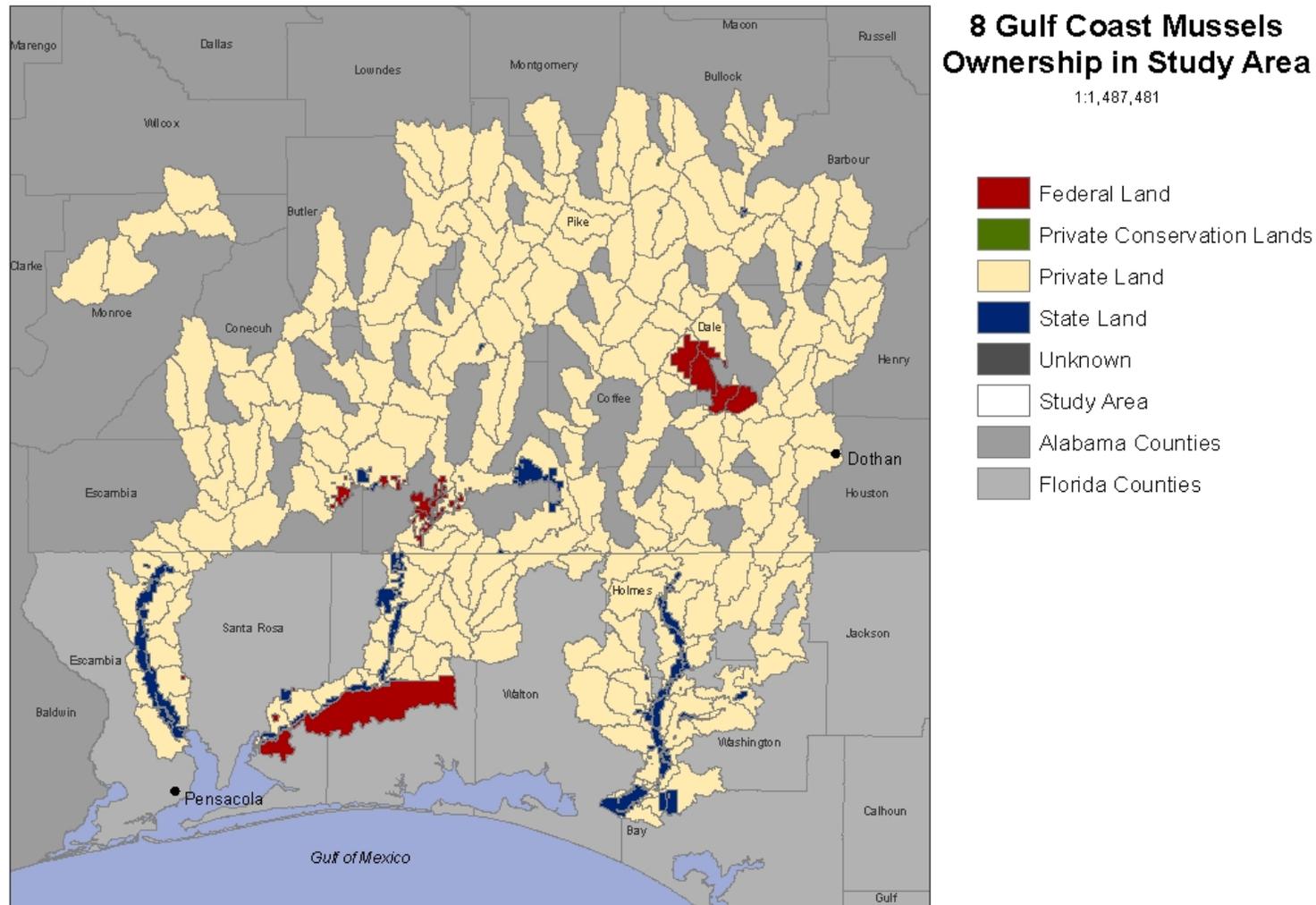


EXHIBIT 1-2. LANDOWNERSHIP WITHIN STUDY AREA



Sources:
 1. US Fish and Wildlife Service, Field Office
 2. Environmental Systems Research Institute, Inc. (ESRI), Redlands, California, USA
 3. Protected Areas Database (PAD-US), CBI Edition 1.1, ProtectedLands.net



EXHIBIT 1-3. LANDOWNERSHIP/MANAGEMENT WITHIN STUDY AREAS

TYPE	LAND AREA (ACRES) ^{1, 2}	PERCENT TOTAL AREA (ACRES) ²
Federal	189,236	2.8%
State	147,593	2.2%
Private Conservation Land	411	0.006%
Private	6,367,430	94.9%
Unknown	374	0.005%
TOTAL	6,705,044	100%
Notes:		
1. Protected Areas Database (PAD-US), CBI Edition 1.1		
2. Totals may not sum due to rounding.		

1.2 ECONOMIC ACTIVITIES CONSIDERED IN THIS ANALYSIS

28. Pollution from point sources and non-point sources, including biological and synthetic substances, degrades water quality. The Service states that pollution from non-point sources represents “the greatest threat to these eight mussels.”³¹ We will address these threats as potential consequences of the identified land- and water-use activities described below. In reviewing the Proposed Rule, a Service memorandum describing potential changes in conservation recommended for the species due to critical habitat designation (see Appendix D), and recovery plans and consultations developed for other listed freshwater mussel species in Alabama and Florida, we identified the following economic activities as potential threats to the eight mussels and their habitat.

1. **Impoundments, Dams, and Diversions** degrade water quality through sedimentation, alter stream hydrology and flow levels, and destroy habitat through direct, in-stream disturbance of substrate.
2. **Dredging, Channelization, and In-Stream Mining** alter stream hydrology and degrade water quality through sedimentation. Disposal of dredged material into proposed critical habitat can alter or destroy substrate through direct, in-stream disturbance. In-stream gravel mining degrades water quality through sedimentation, potentially alters stream hydrology, and destroys substrate through direct, in-stream disturbance.
3. **Transportation and Utilities** projects degrade water quality and alter stream hydrology. Specifically, road, bridge, and in-stream construction (for example, boat launch or dock construction) may cause sediments, nutrients, and contaminants to enter water bodies, and may degrade habitat through direct, in-stream disturbance.

³¹ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

4. **Residential and Commercial Development** may cause riparian habitat and vegetation loss, siltation, and degradation that could adversely affect proposed critical habitat.
 5. **Timber Management, Agriculture, and Grazing** degrade water quality through the removal of riparian vegetation, reduced bank stability, introduction of pesticides and fertilizers, increased sedimentation due to streambank trampling, higher peak flows and channel incisement, lower base flows, changes in channel morphology, and loss of nutrients within the stream channel.
 6. **Oil Wells/Drilling** may degrade water quality through contaminant spills. More than 400 oil wells are located within Alabama's Conecuh and Escambia Counties. The wells are subject to periodic spills either directly at the well site or as a result of transporting the oil. Numerous highways and railroads cross the stream channels, making spills as a result of transportation accidents another constant potential threat.
29. We discuss the level of activity and management of these threats within the study area absent critical habitat (baseline) and following critical habitat designation (incremental) in Chapters 3 and 4, respectively. In addition to the above activities, we also consider impacts to water quality management efforts and DOD land management efforts, which are discussed in greater detail in Chapter 4.

1.3 ORGANIZATION OF THE REPORT

30. The remainder of this report proceeds through four additional chapters. Chapter 2 discusses the framework employed in the analysis. Chapters 3 and 4 describe the baseline protections currently afforded the eight mussels and their habitat, and the incremental impacts of critical habitat designation for the mussels, respectively. In addition, the report includes four appendices: Appendix A considers potential impacts on small entities and the energy industry; Appendix B provides information on the sensitivity of the economic impact estimates to alternative discount rates; Appendix C provides undiscounted impacts by economic activity; and Appendix D provides the Service's memorandum to IEC describing potential changes in conservation recommendations for these species due to critical habitat designation, as well as follow-on communication between the Service and economic analysts.

CHAPTER 2 | FRAMEWORK FOR THE ANALYSIS

31. The purpose of this report is to estimate the economic impact of actions taken to protect the eight mussels and their habitat. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and their habitat within the proposed critical habitat area. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections afforded the eight mussels absent critical habitat designation, including listing under the Act and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the eight mussels.
32. According to section 4(b)(2) of the Act, the Service must consider the economic impacts, impacts to national security, and other relevant impacts of designating any particular area as critical habitat. An area may be excluded from designation as critical habitat if the benefits of exclusion (i.e., the impacts that would be avoided if an area were excluded from the designation) outweigh the benefits of designation so long as exclusion of the area will not result in extinction of the species. **The purpose of the economic analysis is to provide information to assist the Secretary of the DOI in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.**³² In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).³³
33. This chapter describes the framework for this analysis. The chapter first provides a background of case law that led to the selection of the framework applied in this report. We then describe in economic terms the general categories of economic effects that are the focus of the impact analysis, including a discussion of both efficiency and distributional effects. This chapter then defines the analytic framework used to measure these impacts in the context of critical habitat regulation and the consideration of benefits.

³² 16 U.S.C. §1533(b)(2).

³³ Executive Order 12866, Regulatory Planning and Review, September 30, 1993; Executive Order 13563, Improving Regulation and Regulatory Review, January 18, 2011; Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. §§601 et seq; and Pub Law No. 104-121.

It concludes with a description of the information sources relied upon in the analysis and notes on the presentation of the results.

2.1 BACKGROUND

34. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and their habitat within the proposed critical habitat area. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."³⁴ In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.
35. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.³⁵ Specifically, the court stated,

The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation.... Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act].³⁶

³⁴ OMB, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>.

³⁵ *New Mexico Cattle Growers Assn. v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

³⁶ *Ibid.*

36. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.³⁷ For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep't of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service's baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. 'To find the true cost of a designation, the world with the designation must be compared to the world without it.'³⁸

37. More recently, in 2010, the U.S. Ninth Circuit Court of Appeals came to similar conclusions during its review of critical habitat designations for the Mexican spotted owl and 15 vernal pool species.³⁹ Plaintiffs in both cases requested review by the Supreme Court, which declined to hear the cases in 2011.
38. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis will employ "without critical habitat" and "with critical habitat" scenarios:
- The "**without critical habitat**" scenario represents the **baseline** for the analysis, considering protections already afforded the eight mussels. The baseline for this analysis is the state of regulation, absent designation of critical habitat that provides protection to the species under the Act, as well as under other Federal, State and local laws and conservation plans. The baseline includes sections 7, 9, and 10 of the Act to the extent that they are expected to apply absent the designation of critical habitat for the species. The analysis will qualitatively describe how baseline conservation for the eight mussels is currently implemented across the proposed designation in order to provide context for the incremental analysis (Chapter 3).
 - The "**with critical habitat**" scenario describes and monetizes the **incremental** impacts due specifically to the designation of critical habitat for the species. The incremental eight mussels conservation efforts and associated impacts are those

³⁷ *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp. 2d 1115 (N.D. Cal. 2006).

³⁸ *Center for Biological Diversity v. United States Bureau of Land Management* 422 F. Supp.2d 1115 (N.D. Cal. 2006).

³⁹ *Home Builders Association of Northern California v. United States Fish and Wildlife Service*, 616 F.3d 983 (9th Cir. 2010), cert. denied, 179 L. Ed 2d 301, 2011 U.S. Lexis 1392, 79 U.S.L.W. 3475 (2011); *Arizona Cattle Growers v. Salazar*, 606 F. 3d 1160 (9th Cir. 2010), cert. denied, 179 L. Ed. 2d 300, 2011 U.S. Lexis 1362, 79 U.S.L.W. 3475 (2011).

not expected to occur absent the designation of critical habitat. This report focuses on the incremental analysis (Chapter 4).

39. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on “Application of the ‘Destruction or Adverse Modification’ Standard Under Section 7(a)(2) of the Endangered Species Act” and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.⁴⁰ Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, the Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.⁴¹ Under the statutory provisions of the Act, the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species.
40. A detailed description of the methods used to define baseline and incremental impacts is provided in Section 2.3.

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

41. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the eight mussels and their habitat (hereinafter referred to collectively as “eight mussels conservation efforts”). Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of eight mussels conservation efforts.
42. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and

⁴⁰ Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

⁴¹ *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, 378 F.3d 1059 (9th Circuit 2004).

distributional effects, as well as their application in this analysis, are discussed in greater detail below.

2.2.1 EFFICIENCY EFFECTS

43. At the guidance of OMB and in compliance with Executive Order 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect eight mussels habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.⁴²
44. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.
45. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.
46. This analysis begins by measuring impacts associated with efforts undertaken to protect the eight mussels and their habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation efforts is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets. As described in Chapter 4, in the case of the eight mussels, conservation efforts are not anticipated to significantly affect markets; therefore, this report focuses on compliance costs.

⁴² For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

47. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.⁴³ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

48. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.⁴⁴ In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.⁴⁵

Regional Economic Effects

49. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
50. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or

⁴³ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>.

⁴⁴ 5 U.S.C. §§601 *et seq.*

⁴⁵ Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

51. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.
52. Impacts associated with eight mussels conservation efforts reflect increased administrative effort to participate in section 7 consultations. As described in the remainder of this report, critical habitat designation is not expected to affect the levels of economic activity occurring within the region. Therefore, measurable impacts of the type typically assessed with input-output models are not anticipated.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

53. This analysis: 1) identifies those economic activities most likely to threaten the eight mussels and their habitat; 2) describes the baseline regulation protection for the species; and 3) monetizes the incremental economic impacts to avoid adverse modification of the proposed critical habitat area. This section provides a description of the methods used to separately identify baseline protections from the incremental impacts stemming from the proposed designation of critical habitat for the eight mussels. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

2.3.1 IDENTIFYING BASELINE IMPACTS

54. The baseline for this analysis is the existing state of regulation, absent the designation of critical habitat, including the listing of the species under the Act, as well as protection under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.
55. Baseline protections include sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. This analysis describes these baseline

regulations and, where possible, provides examples of the potential magnitude of the costs of these baseline protections. The primary focus, however, is not on baseline costs, since these will not be affected by the proposed regulation. Instead, the focus of this analysis is on monetizing the incremental impacts forecast to result from the proposed critical habitat designation.

- Section 7 of Act, even absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. Consultations under the jeopardy standard result in administrative costs, as well as impacts of conservation efforts resulting from consideration of this standard.
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."⁴⁶ The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with a land or water use activity or project.⁴⁷ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

56. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act (CWA) or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

⁴⁶ 16 U.S.C. 1532.

⁴⁷ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

57. This analysis quantifies the potential incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts resulting from existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.
58. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing conservation efforts (i.e., reasonable and prudent alternatives) resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.

Direct Impacts

59. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any conservation efforts requested by the Service through section 7 consultation to avoid potential destruction or adverse modification of critical habitat.
60. Section 7(a)(2) of the Act requires Federal agencies to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Army Corps of Engineers (Corps). Often, they will also include a third party involved in projects that involve a permitted entity, such as the recipient of a CWA section 404 permit.
61. During a consultation, the Service, the Action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.
62. Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussions between the Service, the Action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat, and are designed to identify and resolve potential concerns at an early stage in the

planning process. By contrast, a *formal consultation* is required if the Action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to minimize those impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants.

Administrative Section 7 Consultation Costs

63. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may affect a species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.
64. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:
 1. **Additional effort to address adverse modification in a new consultation** - New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.
 2. **Re-initiation of consultation to address adverse modification** - Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.
 3. **Incremental consultation resulting entirely from critical habitat designation** - Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of incremental consultations are considered incremental impacts of the designation.
65. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of

consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in a range of estimated administrative costs of consultation.

66. Exhibit 2-1 provides the incremental administrative consultation costs applied in this analysis. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions are applied.
- The greatest effort will be associated with consultations that consider both jeopardy and adverse modification. Depending on whether the consultation is precipitated by the listing or the critical habitat designation, part or all of the costs, respectively, will be attributed to the critical habitat designation.
 - Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations precipitated by the listing result in the least incremental effort, roughly 25 percent of the cost of the entire consultation.⁴⁸ The remaining 75 percent of the costs are attributed to consideration of the jeopardy standard in the baseline scenario. This latter amount also represents the cost of a consultation that only considers adverse modification (e.g., an incremental consultation for activities in unoccupied critical habitat) and is attributed wholly to critical habitat.
 - Incremental costs of the re-initiation of a previously completed consultation because of the critical habitat designation are assumed to be approximately half the cost of a consultation considering both jeopardy and adverse modification. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species. However, because the previously completed effort must be re-opened, they are more costly than simply adding consideration of critical habitat to a consultation already underway.

⁴⁸ *ibid.*

EXHIBIT 2-1. INCREMENTAL ADMINISTRATIVE CONSULTATION COSTS (2011 DOLLARS)

INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Informal	\$2,450	\$3,100	\$2,050	\$2,000	\$9,500
Formal	\$5,500	\$6,200	\$3,500	\$4,800	\$20,000
Programmatic	\$16,700	\$13,900	n/a	\$5,600	\$36,100
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Informal	\$1,230	\$1,550	\$1,030	\$1,000	\$4,750
Formal	\$2,750	\$3,100	\$1,750	\$2,400	\$10,000
Programmatic	\$8,330	\$6,930	n/a	\$2,800	\$18,100
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION					
Informal	\$613	\$775	\$513	\$500	\$2,380
Formal	\$1,380	\$1,550	\$875	\$1,200	\$5,000
Programmatic	\$4,160	\$3,460	n/a	\$1,400	\$9,030
Source: IEC analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2011, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Estimates are rounded to three significant digits and may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

67. To determine appropriate costs per consultation, we consulted Service biologists who participate in section 7 consultation.⁴⁹ In addition, we confirmed these cost estimates with officials at the U.S. Environmental Protection Agency (EPA) Region 4 who were involved with consultations with the Service regarding changes to State water quality standards.⁵⁰ Other relevant stakeholders could not comment on the level of administrative effort involved in section 7 consultation.

Section 7 Conservation Effort Impacts

68. Section 7 consultation considering critical habitat may also result in additional conservation effort recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of conservation efforts undertaken to avoid adverse modification are considered incremental impacts of critical habitat designation. For

⁴⁹ Written communication with Service biologists on December 12, 2011, and on December 13, 2011.

⁵⁰ Personal communication with EPA Region 4, Water Quality Standards Coordinator, on November 9, 2011.

consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated conservation efforts are assumed to be incremental impacts of the designation. This is summarized below.

1. **Additional effort to address adverse modification in a new consultation -** Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
2. **Re-initiation of consultation to address adverse modification -** Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental.
3. **Incremental consultation resulting entirely from critical habitat designation** Impacts of all project modifications are considered incremental.

69. To inform the economic analysis, the Service provided a memorandum describing its expected approach to conservation for the eight mussels following critical habitat designation.⁵¹ Specifically, this memorandum provides information on how the Service intends to address projects that might lead to adverse modification of critical habitat as distinct from projects that pose jeopardy to the species. In the memorandum, the Service states:

Alterations of habitat that diminish the value (e.g., actions which alter hydrology, water quality, or suitability of substrate) and the amount of habitat available for the species would be likely to affect their population size and ability to recruit, as well as cause further range declines, and would, therefore, appreciably reduce their likelihood of survival in the wild and constitute jeopardy. In most cases, the results of consultation under the adverse modification and jeopardy standards are likely to be similar because ... the primary constituent elements that define critical habitat are also essential for the survival of the eight mussels.⁵²

70. In other words, due to the close ties between the survival of these eight mussel species and the quality of their habitat, any conservation efforts the Service requests to avoid adverse modification of critical habitat will most likely match those requested to avoid jeopardy. The Service anticipates that the conservation efforts it would recommend to avoid jeopardy to any one of the species would be the same conservation efforts it would recommend to avoid adverse modification of critical habitat for any of the other mussel species.⁵³
71. In addition, while each of the eight mussel species does not occur in each of the nine units, every unit is occupied by at least one mussel species. Consequently, we anticipate

⁵¹ U.S. Fish and Wildlife Service to Industrial Economics, Inc. July 15, 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical habitat for Eight Southeastern Mussels." See Appendix D.

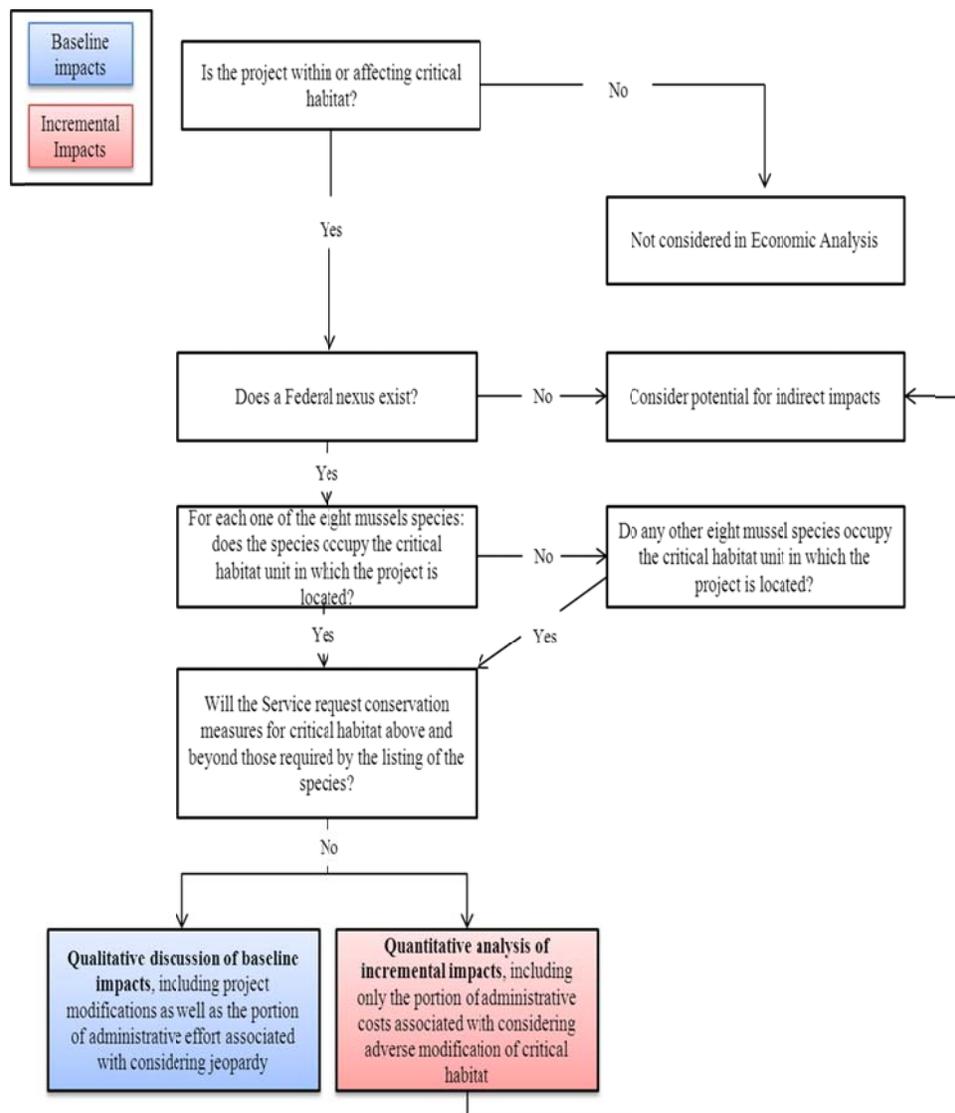
⁵² *Ibid.*

⁵³ Email communication from the Service's Atlanta, GA Field Office to Industrial Economics, October 12, 2011.

that critical habitat designation will not generate additional requests for project modification in any of the proposed critical habitat units.

- 72. As a result, this analysis finds that the incremental economic impacts of the critical habitat designation will likely be limited to additional administrative costs to the Service, Federal agencies and private third parties of considering critical habitat as part of section 7 consultation.
- 73. Exhibit 2-2 summarizes the decision framework employed to support the conclusion that critical habitat designation is unlikely to generate additional conservation for the mussels.

EXHIBIT 2-2. FRAMEWORK FOR DETERMINING BASELINE AND INCREMENTAL IMPACTS



Indirect Impacts

74. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

Habitat Conservation Plans

75. Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act. No HCPs exist that consider the eight mussels or their habitat.

Other State and Local Laws

76. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.
77. In California, for example, the California Environmental Quality Act (CEQA) requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were “categorically exempt” from preparing an EIR under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation.
78. In the case of eight mussels critical habitat, no indirect, incremental effects are anticipated in association with State and local regulation. ADEM and FDEP regulate water quality within the proposed critical habitat through State water quality regulations. While listed species and critical habitat are considered by certain ADEM and FDEP programs, the presence of critical habitat does not trigger different behavior or requirements on the part of the ADEM or FDEP over and above those triggered by the

presence of listed species.⁵⁴ Chapter 3 of this report discusses these baseline regulations in greater detail.

Additional Indirect Impacts

79. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:
- **Time Delays** - Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
 - **Regulatory Uncertainty** - The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.
 - **Stigma** - In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not adjacent to a stream designated as critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

Indirect impacts may also result from critical habitat providing new information regarding where project proponents should consult regarding potential impacts on the species or habitat. Because the listing of the species and the critical habitat designation are being proposed coincidentally, it is difficult to determine whether the critical habitat

⁵⁴ Personal communication with ADEM, on October 12, 2011; personal communication with FDEP, on October 12, 2011.

designation specifically generates the understanding of the areas in which the species are present. In other words, it is unclear whether the critical habitat designation will generate improved understanding above and beyond that provided by the listing of where project proponents should consult with the Service.

2.3.3 BENEFITS

80. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.⁵⁵ OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.⁵⁶
81. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.⁵⁷ *Rather than rely on economic measures, the Service believes that the direct benefits of the Proposed Rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*
82. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat. As there is expected to be no change in management practices due to this proposed critical habitat designation, the analysis does not anticipate any direct or ancillary economic benefits.

⁵⁵ Executive Order 12866, Regulatory Planning and Review, September 30, 1993.

⁵⁶ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf>

⁵⁷ *Ibid.*

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

83. The lateral extent of the proposed critical habitat extends to the ordinary high water line.⁵⁸ As described in Chapter 1, this analysis evaluates impacts of critical habitat designation on activities within or affecting the proposed critical habitat area. In order to capture the land and water use threats occurring outside of the proposed critical habitat that may affect the physical and biological features of critical habitat, we identify a broader study area for the analysis including all sixth level HUC watersheds containing the streams proposed for critical habitat designation, as defined in Section 1.1.2 (see Exhibit 1-1).

2.3.5 ANALYTIC TIME FRAME

84. Ideally, the time frame of this analysis would be based on the expected time period over which the critical habitat regulation is expected to be in place. Specifically, the analysis would forecast impacts of implementing this rule through species recovery (i.e., when the rule is no longer required). Recent guidance from OMB indicates that “if a regulation has no predetermined sunset provision, the agency will need to choose the endpoint of its analysis on the basis of a judgment about the foreseeable future.”⁵⁹ The “foreseeable future” for this analysis includes, but is not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. Forecasted impacts will be based on the planning periods for potentially affected projects and will look out over a 20-year time horizon for most activities. OMB supports this time frame stating that “for most agencies, a standard time period of analysis is ten to 20 years, and rarely exceeds 50 years.”⁶⁰ Therefore, this analysis considers economic impacts to activities over a 20-year period from 2012 (expected year of final critical habitat designation) through 2031.

2.4 INFORMATION SOURCES

85. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, the Corps, State and local government agencies, and other stakeholders. In particular, the incremental effects memorandum provided by the Service and follow-on communication with relevant Federal and State regulatory agencies (see Appendix D). In addition, this analysis relies upon the Service’s section 7 consultation record for other listed mussel species, including a portion that additionally consider these eight mussel species as candidate species. Data on baseline land use were obtained from regional planning authorities. A complete list of references is provided at the end of this document.

⁵⁸ Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁵⁹ U.S. Office of Management and Budget, February 7, 2011. “Regulatory Impact Analysis: Frequently Asked Questions (FAQs).” Accessed on May 3, 2011 by http://www.whitehouse.gov/sites/default/files/omb/circulars/a004/a-4_FAQ.pdf.

⁶⁰ *Ibid.*

2.5 PRESENTATION OF RESULTS

86. Impacts are described in present value and annualized terms applying discount rates of seven percent throughout the body of the report. Additionally, Appendix B provides the present and annualized value of impacts in each unit applying a three percent discount rate for comparison with values calculated at seven percent.⁶¹ Appendix C presents undiscounted annual impact values by activity and subunit. Present value and annualized impacts are calculated according to the methods described in Exhibit 2-3.

⁶¹ The OMB requires Federal agencies to report results using discount rates of three and seven percent (see OMB, Circular A-4, 2003).

EXHIBIT 2-3. CALCULATING PRESENT VALUE AND ANNUALIZED IMPACT

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of critical habitat designation; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) from year t to T is measured in 2011 dollars according to the following standard formula:^a

$$PV_c = \sum_t^T \frac{C_t}{(1+r)^{t-2011}}$$

C_t = cost of eight mussels critical habitat conservation efforts in year t

r = discount rate^b

Impacts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, development activities employ a forecast period of 20 years, 2012 through 2031. Annualized future impacts (APV_c) are calculated by the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1-(1+r)^{-N}} \right]$$

N = number of years in the forecast period (in this analysis, 29 years)

^a To derive the present value of future impacts to development activities, t is 2012 and T is 2031.

^b To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.)

CHAPTER 3 | BASELINE CONSERVATION FOR THE EIGHT MUSSELS WITHIN THE PROPOSED CRITICAL HABITAT

87. This chapter discusses the baseline state of conservation for the eight mussel species absent designation of critical habitat. The species and habitat protections described in this chapter result from implementation of the Act, as well as other Federal, State and local regulations and conservation plans. These protections are not generated or affected by critical habitat designation for the eight mussel species, and thus we do not quantify the associated impacts in this analysis. The qualitative discussion of baseline protections provides context for the incremental analysis in Chapter 4. Specifically, this chapter discusses mussel conservation efforts anticipated to occur due to the listing of the species, while Chapter 4 focuses on whether and how critical habitat designation may generate additional conservation for the species.

KEY ISSUES AND CONCLUSIONS OF THE BASELINE ANALYSIS

- Because all proposed critical habitat units are occupied by one or more of the eight mussel species, the Act provides a high level of baseline protections to eight mussel critical habitat. In addition to the Act, State water quality regulations also provide conservation benefits to eight mussel habitat by protecting water quality. Based on conversations with Service biologists, the Service does not anticipate requesting additional project modifications due to critical habitat over and above those requested for the listing of the eight mussels. Conversations with stakeholders also indicate that critical habitat will not result in project modifications over and above those occurring under the listing of the species.
- Under section 404 of the CWA, any operation involving dredge or fill of the waters of the United States is required to receive a permit issued by the Army Corps of Engineers (“the Corps”). This broad permitting requirement serves as the main Federal nexus for activities that may threaten the eight mussels or their critical habitat. Four of the six activities listed in Chapter 1 and described again in this chapter are subject to section 404 permitting requirements—Impoundments, Dams, and Diversions; Dredging, Channelization, and In-Stream Mining; Development; and Transportation and Utilities.
- Impoundments, Dams, and Diversions. There are currently 227 dams within the study area, but only three of these dams are subject to federal regulation. Of these three, one was exempted from regulation by the Federal Energy Regulatory Commission (FERC) and two will not be subject to re-licensing by FERC until after the timeframe for this analysis. In addition, there are currently three known future dam projects that are expected to occur within the study area (specifically, in units AP2, GCM5, and GCM6). All of these projects are expected to require 404 permitting from the Corps, and are therefore expected to result in section 7 consultation. Because any conservation efforts recommended through section 7 would occur regardless of critical habitat designation, impacts of mussels conservation recommended for these projects are considered baseline impacts.
- Dredging, Channelization, and In-stream Mining. Levels of dredging, channelization, and in-stream mining activities are very low across the study area. Only two future consultations are forecast for this type of activity in the study area during the timeframe of the analysis. Because conservation efforts and project modifications recommended through section 7 would occur regardless of critical habitat designation, impacts of mussels conservation recommended for these projects are considered baseline impacts.
- Transportation and Utilities. Within the study area, the Alabama and Florida Departments of Transportation (DOTs) identified 591 roadways and bridges—110 in Alabama and 481 in Florida. Such activity is subject to a Federal nexus through Federal funding received by State DOTs. Within Florida, 98 roadways cross streams proposed as critical habitat. In Alabama, GIS data on roads that cross proposed critical habitat were not available. Nineteen in-stream transportation construction projects, which are subject to section 404 permitting by the Corps, have occurred within the study area in the last ten years. Eighteen utilities projects were permitted by the Corps in the past ten years. Also, no recent natural gas utility activity has been permitted by Federal Energy Regulation Commission since 2009 and none is planned or ongoing within the study area. Because any conservation efforts recommended through section 7 would occur regardless of critical habitat designation, impacts of mussels conservation recommended for these projects are considered baseline impacts.
- Development. Levels of commercial and residential development activity are low across the study area. The lands in the study area are rural and have experienced very low levels of growth over the past decade. The only development projects that would lead to section 7 consultation are those that require 404 permitting with the Corps. Because conservation efforts and project modifications recommended through section 7 would occur regardless of critical habitat designation, impacts of mussels conservation recommended for these projects are therefore considered baseline impacts.
- Timber Management, Agriculture, and Grazing. Timber management, agriculture, and grazing activities are exempt from section 404 permitting under section 404(f) of the CWA, provided that such operations are compliant with the mandatory Best Management Practices (BMPs) promulgated by the Corps, governing silviculture, farming, and grazing activity. These activities also commonly receive Federal funding through the Natural Resources Conservation Service, which serves as a Federal nexus for these activities. Because any conservation efforts recommended through section 7 would occur regardless of critical habitat designation, impacts of mussels conservation recommended for these projects are considered baseline impacts.
- Oil Wells/Drilling. Oil wells and drilling operations occur primarily on private lands and generally are not subject to a Federal nexus within the study area. Emergency spill response activity related to oil wells and drilling operations is carried out by ADEM and FDEP. Because any conservation efforts recommended through section 7 would occur regardless of critical habitat designation, impacts of mussels conservation recommended for these projects are considered baseline impacts.

3.1 BASELINE PROTECTIONS

88. This section first describes baseline water quality protections benefiting the eight mussels under the CWA and State water quality regulations. The section continues with a discussion of baseline conservation efforts afforded the eight mussels in association with each of the six land- and water-use activities discussed in Section 1.2 of this report. Section 3.2 includes a discussion of conservation measures commonly requested by the Service in section 7 consultation, the current and historical prevalence of the six land- and water-use activities, and the relevant Federal regulatory framework that applies to each of these activities.

3.1.1 CLEAN WATER ACT

89. Section 404 of the CWA requires project proponents to obtain a permit from the Corps prior to discharging dredge or fill material into “waters of the United States.”⁶² Due to the riverine nature of eight mussels habitat, the Corps issues section 404 permits within the areas proposed for critical habitat designation. Many of the activities listed as threats to the eight mussels in the Proposed Rule require section 404 permits if they involve dredge or fill of streams. Activities subject to section 404 permitting include:

- Impoundments, Dams, and Diversions
- Dredging, Channelization, and In-Stream Mining
- Development
- Transportation and Utilities

90. As part of the section 404 permit process, the Corps reviews the potential effects of the proposed action on plant and animal populations and recommends efforts to avoid adverse effects to these populations in addition to the wetlands themselves. In general, conservation efforts for plants and animals include:

- Select sites or manage discharges to ensure that habitat remains suitable for indigenous species.
- Avoid sites having unique habitat or other value, including habitat of threatened or endangered species.
- Utilize habitat development and restoration techniques to minimize adverse impacts and compensate for destroyed habitat.
- Time discharge to avoid biologically critical time periods.
- Avoid the destruction of remnant natural sites within areas already affected by development.⁶³

⁶² U.S. Code. Title 33, 1344.

⁶³ 40 CFR Part 230.75.

91. These conservation efforts would be required by the Corps for section 404 permits regardless of critical habitat designation.⁶⁴ Accordingly, impacts of implementing these conservation efforts are considered baseline impacts of eight mussels conservation.
92. Corps review of projects for the issuance of section 404 permits also requires section 7 consultation with the Service to the extent that the project may affect listed species or critical habitat. Chapter 4 discusses the potential for additional project modifications, above section 404 protections, that may result from critical habitat designation for the mussels.

3.1.2 STATE WATER QUALITY REGULATIONS

93. According to the Proposed Rule, “adequate water quality is essential for normal behavior, growth, and viability during all life stages of the” eight mussels.⁶⁵ The Service believes that most numeric standards for pollutants and water quality parameters (for example, dissolved oxygen, pH, heavy metals, turbidity) that have been adopted by Florida and Alabama under the CWA represent levels that are “essential to the conservation of” each of these eight mussels. That is, the Service believes most numeric water quality standards adopted by Florida and Alabama to be sufficiently protective of the eight mussels. Under the authority of the CWA, ADEM and FDEP set, maintain, and enforce water quality standards in Alabama and Florida, respectively. State water quality standards are reviewed by the EPA to ensure that they comply with national minimum protections under the CWA. To ensure that all State water quality standards sufficiently protect federally listed species and critical habitat, EPA consults with the Service whenever a State promulgates a water quality rule. The EPA and the Service also enter consultation on a triennial basis to review all State water quality standards to ensure they are protective of listed species and critical habitat.⁶⁶ Such consultation may result in administrative costs related to addressing eight mussels critical habitat in consultation.
94. ADEM and FDEP administer several programs under the CWA that may affect water quality in the mussels’ proposed critical habitat and thereby provide some level of protection to the species. For some programs, the presence of listed species or critical habitat may affect the outcome of water quality standards. ADEM and FDEP do not treat critical habitat differently than the presence of listed species.⁶⁷ In the case of the eight mussels, since all proposed critical habitat units are occupied by one or more of the species, ADEM and FDEP confirm that the presence of the species, not critical habitat, would be responsible for any changes in water quality standards.⁶⁸ Relevant programs provided by ADEM and FDEP are listed below, along with the role of listed species and critical habitat in the program.

⁶⁴ *Ibid.*

⁶⁵ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁶⁶ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011.

⁶⁷ *Ibid.*

⁶⁸ *Ibid.*

Alabama⁶⁹

- ADEM sets numeric criteria for over 100 water quality parameters, including metals, dissolved oxygen, pH, temperature, and toxic organic compounds, among others. EPA reviews the proposed criteria and consults with the Service to determine potential effects on listed species and critical habitat. In the past, ADEM has promulgated numeric criteria based on the sensitivity of aquatic species, including freshwater mussels in the State. There have been no other numeric water quality criteria set in response to the presence of freshwater mussels, listed or otherwise, in the State.
- Alabama has primacy in issuing National Pollution Discharge Elimination System (NPDES) permits under the CWA. Under the NPDES program, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a NPDES permit.⁷⁰ Because the State of Alabama, ADEM specifically, issues NPDES permits instead of the EPA, NPDES permitting activity is not subject to a Federal nexus. Additionally, the Service and the EPA previously conducted a programmatic consultation on NPDES permitting. The result of this programmatic consultation is that the issuance of each permit does not generate consultations with the Service, unless there is a suspected conflict not included in the programmatic consultation that could affect listed species.
- ADEM lists section 303(d) Impaired Waters in Alabama. Water bodies listed as impaired under section 303(d) contain levels of pollutants that restrict the intended use of the water bodies, such as providing drinking water, recreational waters, or supporting aquatic life. Impaired Waters receive additional protections in the form of elevated permitting requirements and the assignment of Total Maximum Daily Loads (TMDLs), which serve as a limitation on the allowable amount of pollutants discharged into the water body. TMDLs, set by ADEM, consider the sensitivity of aquatic life and human health in an effort to restrict pollutant discharge into the water body. No specific provision exists for consideration of listed species or critical habitat in section 303(d) of the CWA, but ADEM may evaluate either the presence of listed species or critical habitat, regardless, as a potential factor in listing a stream as impaired. Eleven streams proposed for critical habitat are listed as impaired waters in Alabama: one in Unit AP2, two in Unit GCM1, one in Unit GCM3, one in Unit GCM4, two in Unit GCM5, three in Unit GCM6, and one in Unit GCM7.⁷¹ As all critical habitat is occupied by the species, ADEM does not expect the presence of critical habitat to generate additional considerations in decisions to designate Impaired Waters. That is, critical habitat would not generate additional scrutiny above and beyond

⁶⁹ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011. Listed streams include: Bear Creek, Big Creek, Choctawhatchee River, Conecuh River, Mill Creek, Pea River, Pond Creek, Sepulga River, Yellow River, Patsaliga Creek, and Burnt Corn Creek.

⁷⁰ U.S. EPA, "Water Permitting 101," accessed at <http://www.epa.gov/npdes/pubs/101pape.pdf> on December 27, 2011.

⁷¹ ADEM. "Alabama Section 303(d) List, 2010," accessed at <http://adem.alabama.gov/programs/water/wquality/2010AL303dList.pdf> on December 29, 2011.

the presence of the listed mussel species in determining whether a water body should be added to the Impaired Waters list. In the event that a stream were added to Alabama's section 303(d) list due to, at least in part, the presence of listed mussel species, the change in water quality standards would be considered a baseline effect of the listing of the species. However, it is unlikely that ADEM would add a stream in Alabama to the 303(d) list out of consideration for listed species or critical habitat. Only once in the last 20 years has ADEM cited disturbance of habitat as a reason for adding a stream to the 303(d) list. The stream was not located within the study area—it was in the Cahaba River basin—and the species was not listed.

- ADEM also designates “Outstanding Alabama Waters” (OAWs). In contrast to section 303(d) Impaired Waters, which aim to restore heavily polluted waters, the OAW program aims to protect waters that are already outstanding recreational or ecological resources. Protections afforded OAWs include: increased permitting requirements; increased restrictions on pollutant discharges of sewage, industrial wastes, or other wastes; and establishment of site specific water quality criteria such as pH, temperature, dissolved oxygen, bacteria, radioactivity, and turbidity. The presence of listed species or critical habitat is one of several factors that could elevate a water body to the OAW classification. While no streams proposed for critical habitat are currently listed as OAWs, Bear Creek, Sandy Creek, and West Fork Choctawhatchee River are listed as OAW candidates.⁷² Similar to the listing of impaired waters, ADEM does not expect the presence of critical habitat to generate additional considerations in decisions to designate impaired waters above and beyond those considerations associated with the presence of the listed mussel species. In addition, the presence of listed species is not considered to be a major factor in designating OAWs.

Florida⁷³

- Like ADEM, FDEP sets numeric criteria for approximately 100 water pollutants for the protection of aquatic life and human health in surface water, as recommended by the EPA, such as metals, dissolved oxygen, pH, temperature, and toxic organic compounds. EPA reviews proposed criteria and consults with the Service to determine potential effects on listed species and critical habitat. Similar to Alabama, FDEP based water quality criteria for ammonia on the sensitivity specifically of freshwater mussels in the State. The listing status of the freshwater mussels did not factor in to this decision, however.
- FDEP also has primacy in issuing NPDES permits under the CWA and, therefore, issuance of each permit does not generate consultation with the Service.
- FDEP lists section 303(d) Impaired Waters in Florida. Like ADEM in Alabama, FDEP sets TMDLs for Impaired Waters in Florida. FDEP may consider the

⁷² Written communication with Chief Officer, Water Quality Branch, ADEM, on October 19, 2011.

⁷³ Personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011.

presence of listed species and critical habitat in evaluating water bodies for listing, even though no specific provision for consideration of listed species or critical habitat exists in section 303(d) of the CWA. Seventeen streams proposed for critical habitat are currently listed as impaired by FDEP: 12 in Unit GCM6, three in Unit GCM5, and two in Unit GCM1.⁷⁴ FDEP has stated, however, that it does not expect the presence of critical habitat to influence decisions regarding listing or delisting of a water body as impaired above and beyond the consideration of the presence of listed mussel species.

- FDEP also designates “Outstanding Florida Waters” (OFWs). The designation affords similar protections to the OAW designation, including permitting requirements, restrictions on discharges, and site specific water quality criteria. In Florida, the Choctawhatchee and Shoal Rivers, proposed for critical habitat in Units GCM5 and GCM6, are designated OFWs. As in Alabama, while the presence of listed species or critical habitat may factor into decisions regarding whether to designate a water body as an OFW, FDEP has indicated that critical habitat is not likely to influence decisions above and beyond the consideration given the water bodies due to the presence of the listed mussels. The presence of listed species makes up “about five percent” of the decision making process in designating OFWs. Generally, FDEP anticipates very few additional OFWs in the future due to strong public opposition to such designations.
- Florida’s Environmental Resource Permitting (ERP) Program regulates activities that may alter surface water flows, including dredging, filling, and construction projects involving wetlands, as well as stormwater and surface water management systems. The purpose of the Program is to streamline the permitting process for wetland resources and for the management and storage of surface waters by requiring review and issuance of a single permit. In the study area for this analysis, permits are issued by either the FDEP or the NFWFMD, depending on the type and size of project.⁷⁵ Issuance of a permit requires an assessment of the impacts of the proposed projects on fish and wildlife species. Applicants must provide reasonable assurances that the proposed activity, “will not impact the values of wetland and other surface waters so as to cause adverse impacts to: (a) The abundance of fish, wildlife and listed species; and (b) The habitat of fish, wildlife and listed species.”⁷⁶ The FDEP or NFWFMD provides permit applications to the Florida Fish and Wildlife Conservation Commission for review and comment and may request assistance from the Commission in the

⁷⁴ FDEP, “Florida 303(d) Listed Waters for Reporting Year 2010,” accessed at http://iaspub.epa.gov/tmdl_waters10/attains_impaired_waters.impaired_waters_list?p_state=FL&p_cycle=2010 on December 29, 2011. These streams include Alligator Creek, Bear Creek, the Choctawhatchee River, Eightmile Creek, Holmes Creek, Limestone Creek, Mill Creek, Pine Log Creek, Pond Creek, Sandy Creek, Shoal River, Sikes Creek, Tenmile Creek, Yellow River, Flat Creek, Escambia River, and Blue Creek.

⁷⁵ Florida Department of Environmental Protection, “Rules of the Environmental Resource Permitting (ERP), Wetland Resource Permitting, and Submerged Lands Program,” accessed at <http://www.dep.state.fl.us/water/wetlands/erp/rules/guide.htm> on May 16, 2012.

⁷⁶ Florida Department of Environmental Protection and Northwest Florida Water Management District. Environmental Resource Permit Applicant’s Handbook: Volume I (General and Environmental). November 1, 2010.

assessment of impacts to listed wildlife species. This assessment is required by the ERP Program if the project has the potential to impact a listed wildlife species, regardless of whether critical habitat is present for that species.

95. As noted above, the promulgation of new or additional water quality standards in both States are subject to review by EPA Region 4. This review generates section 7 consultation with the Service to ensure that the water quality standards are sufficiently protective of listed species and critical habitats. In Alabama and Florida, the promulgation of new or additional water quality standards and associated consultation between the Service and the EPA occurs roughly one to five times per year in each State.⁷⁷ Additionally, EPA Region 4 engages in triennial reviews with ADEM and FDEP in which all State water quality standards are evaluated.⁷⁸ With each review, EPA Region 4 enters consultation with the Service. Section 3.5 and Section 4 of this report include a description of this process, and the potential incremental effect of critical habitat on these consultations.

3.2 ECONOMIC ACTIVITY WITHIN THE PROPOSED CRITICAL HABITAT FOR THE EIGHT MUSSELS

96. As discussed in Chapter 1, this analysis focuses on the following threats to critical habitat for the eight mussels: (1) Impoundments, Dams, and Diversions; (2) Dredging, Channelization, and In-Stream Mining; (3) Transportation and Utilities; (4) Residential and Commercial Development; (5) Timber Management, Agriculture, and Grazing; and (6) Oil Wells/Drilling.
97. This section discusses baseline protection afforded the eight mussels for each of these activities. As the eight mussels have not been previously listed, there are no past section 7 consultations from which to derive a list of project modifications requested by the Service to avoid jeopardy to the species. This analysis therefore references examples of project modifications requested through section 7 consultations for other listed freshwater mussel species in Florida and Alabama. The Service provided these specific consultations as representative examples of the project modifications most likely to be requested as part of consultation on the eight mussels in order to avoid jeopardy to the species (i.e., as baseline conservation effort examples for this analysis).
98. Exhibit 3-1 summarizes baseline conservation efforts for the eight mussels by activity. These are project modifications that may be recommended by the Service due to the listing of these species (i.e., absent critical habitat designation). Sections 3.2.1 through 3.2.6 summarize the baseline regulation of these activities, identifying Federal permits or regulatory compliance that may be required and describing the potential level of activity forecast to occur within the study area over the next 20 years. Chapter 4 of this analysis

⁷⁷ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011.

⁷⁸ Personal communication with State Water Quality Standards Coordinator, EPA Region 4, on November 11, 2011.

focuses on the potential incremental effects of critical habitat designation on these activities.

EXHIBIT 3-1. SUMMARY OF BASELINE CONSERVATION EFFORTS BY ACTIVITY

ACTIVITIES	POTENTIAL THREATS ¹	POTENTIAL BASELINE CONSERVATION EFFORTS
Impoundments, Dams, and Diversions	Alteration, Reduction, or Elimination of River Flow	<ul style="list-style-type: none"> • Establish minimum flows downstream of dams and water withdrawals.⁵ • Implement mussel surveying and monitoring plans.⁴ • Remove obsolete dams or repair structures that prevent fish or mussel passage.⁵ • Develop relocation plans for listed mussels found within the footprint of in-channel project construction.² • Increase monitoring and enforcement of Best Management Practices (BMPs) for sediment and erosion control.^{1,3} • Protect and restore riparian vegetation.⁵ • Reduce pesticide and nutrient inputs to streams.⁵
	Blockage of Upstream and Downstream Movement of Mussels and Host Fish	
	Increased Turbidity and Sedimentation	
	Alteration of Habitat Quality	
	Alteration of Water Temperature and Quality	
Dredging, Channelization, and In-Stream Mining	Increased Turbidity and Sedimentation	<ul style="list-style-type: none"> • Increase monitoring and enforcement of BMPs for sediment and erosion control.^{1,3} • For in-stream projects, use proper turbidity controls such as turbidity curtains during all phases of construction to reduce sedimentation.² • Protect or restore riparian vegetation.⁵ • Implementation of mussel surveying and monitoring plans.⁴ • Operate dredge equipment in a manner that minimizes take.² • Use upland areas for dredged material disposal or within-channel areas where listed mussels are absent.²
	Alteration, Reduction, or Elimination of River Flow	
	Physical disturbance of stream substrates	
Transportation and Utilities	Water Quality Impairment (including sedimentation, nutrification, decreased dissolved oxygen concentration, increased acidity and conductivity)	<ul style="list-style-type: none"> • Implementation of mussel surveying and monitoring plans.⁴ • In-stream work shall be kept to a minimum during the removal and repair of existing bridge structures and approaches.³ • Stream crossing construction or repair should consider spanning the bankfull width of the stream channel and the floodplain.² • Follow the NW F1 Unpaved Road Stream Crossing Manual for all roads and stream crossing work.² • When possible, use directional boring

ACTIVITIES	POTENTIAL THREATS ¹	POTENTIAL BASELINE CONSERVATION EFFORTS
		under streambeds. ² <ul style="list-style-type: none"> • Restore streams to natural channel morphology.² • Use turbidity curtains to reduce sedimentation, siltation, and turbidity during in-stream projects.⁷
Residential and Commercial Development	Pollution from stormwater runoff due to increased impervious surface and drainage system installation Sedimentation from construction activity	<ul style="list-style-type: none"> • Implementation of mussel surveying and monitoring plans.⁴ • Use effective sediment and erosion controls such as silt fencing to avoid entry of sediment and other pollutants into the river.² • Divert surface runoff from disturbed areas into non-erodible areas and filter silt-laden water before returning to waterway.³
Timber Management, Agriculture, and Grazing	Water Quality Impairment (including sedimentation, nutrification, decreased dissolved oxygen concentration, increased acidity and conductivity) Altered flow	<ul style="list-style-type: none"> • Implementation of mussel surveying and monitoring plans.⁴ • Reduce sediment, pesticide, and nutrient inputs to streams.⁵ • Maintain riparian buffers of at least 100 feet.²
Oil Wells/Drilling	Water Quality Impairment due to Spills	<ul style="list-style-type: none"> • Implementation of conservation measures to reduce adverse effects or disruptive effects associated with oil operations.⁶
Sources: <ol style="list-style-type: none"> 1. 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482. 2. "PCFO Stream Crossing Conservation Measures for Mussels" provided by the U.S. Fish and Wildlife Service to Industrial Economics, Inc. on September 7, 2011. 3. "FEMA Programmatic Freshwater mussels (conservation measures)" provided by the U.S. Fish and Wildlife Service to Industrial Economics, Inc. on September 7, 2011. 4. Water Resource Associates, Inc. 2006. Draft Technical Report: MFL Establishment for the Upper Santa Fe River. Prepared for the Suwannee River Water Management District in association with SDII Global, Janicki Environmental and Intera, Inc. December 2006. 5. U.S. Fish and Wildlife Service. 2003. Recovery Plan for Endangered Fat Threeridge (<i>Amblema neisleri</i>), Shinyrayed Pocketbook (<i>Lampsilis subangulata</i>), Gulf Moccasinshell (<i>Medionidus penicillatus</i>), Ochlockonee Moccasinshell (<i>Medionidus simsonianus</i>), Oval Pigtoe (<i>Pleurobema pyriforme</i>) and Threatened Chipola Slabshell (<i>Elliptio chipolaensis</i>), and Purple Bankclimber (<i>Elliptoideus sloatianus</i>). Atlanta, Georgia. 142 pp. 6. U.S. Department of the Interior, Fish and Wildlife Service, Bureau of Land Management's Alabama and Mississippi Resource Management Plan (2008-I-0470), June 17, 2008. 7. "Land's Landing Boar Ramp Basin Dredging Project on the Chipola River, Gulf County, Florida: Biological Opinion, August 31, 2011" provided by the U.S. Fish and Wildlife Service to Industrial Economics, Inc. on October 26, 2011. 		

3.2.1 IMPOUNDMENTS, DAMS, AND DIVERSIONS

99. The Service's primary concern regarding the relicensing of dams with respect to the eight mussel species is that the dams are barriers to fish migration and to the movement of mussel host species, thereby preventing gene exchange between upstream and downstream mussel populations.⁷⁹ In addition, loss of habitat and range due to dam and impoundment projects may threaten survival of the mussels. Decreased flow, altered water temperature, and other habitat-altering factors may occur downstream of the dams, also negatively affecting the species.
100. Under the Federal Power Act, the Federal Energy Regulatory Commission (FERC) issues licenses for privately owned hydropower facilities.⁸⁰ As a Federal agency, FERC undertakes section 7 consultation with the Service to consider the potential effects of the licensed projects on listed species and critical habitats. FERC hydropower licenses are valid for 30, 40, or 50 years, depending on the extent of proposed new development or environmental mitigation and enhancement measures. Consequently, FERC undertakes consultation with the Service upon initially permitting a project, and every subsequent 30, 40, or 50 years, as long as the permit is re-issued throughout the life of the project. FERC may also issue exemptions from licensing. Two types of small hydroelectric projects are eligible for exemptions from licensing: (1) A small conduit hydroelectric facility up to 15 MW (up to 40 MW for certain projects) may be eligible for a Conduit Exemption; and (2) A small hydroelectric project of 5 MW or less may be eligible for a 5 MW exemption.⁸¹ FERC maintains up-to-date records of dam licenses and exemptions.⁸²
101. Non-Federal dams that do not produce power (and are therefore not licensed by FERC) and are located in navigable waters of the U.S. are regulated by the Corps pursuant to Section 10 of the Rivers and Harbors Act (RHA) of 1899 and Section 404 of the CWA.⁸³ Section 10 of the RHA requires authorization from the Corps for the construction of any structure in or over navigable waters of the U.S., as well as the excavation/dredging or deposition of material in these waters or any obstruction or alteration in navigable water.⁸⁴ The Corps permits the construction and maintenance of dams; once this work is complete, however, dams are not required to be re-permitted. Consultation with the Service is therefore typically only undertaken upon the development of a new dam project.

⁷⁹ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁸⁰ United States Code: Title 16, Chapter 12. "Federal Regulation and Development of Power."

⁸¹ Federal Energy Regulatory Commission. (2004). "Handbook for Hydroelectric Project Licensing and 5 MW Exemptions from Licensing." Available at http://www.ferc.gov/industries/hydropower/gen-info/handbooks/licensing_handbook.pdf. Accessed on December 28, 2011.

⁸² Federal Energy Regulatory Commission. (2011). "FERC: Hydropower." Available at <http://www.ferc.gov/industries/hydropower.asp>. Accessed on December 29, 2011.

⁸³ U.S. Army Corps of Engineers. (2007). "Practices for Documenting Jurisdiction under Section 404 of the Clean Water Act (CWA) and Sections 9 & 10 of the Rivers & Harbors Act (RHA) of 1899." Available at <http://www.usace.army.mil/CECW/Documents/cecwo/reg/rqls/rql07-01.pdf>. Accessed on December 29, 2011.

⁸⁴ Section 10 of the Rivers and Harbors Act of 1899, 33 U.S.C. 403. Available at <http://www.usace.army.mil/CECW/Documents/cecwo/reg/materials/rhsec10.pdf>. Accessed on December 28, 2011.

102. In the Florida counties containing proposed critical habitat for the eight mussels, dam, impoundment and diversion activities are also regulated by the NFWFMD. However, the NFWFMD works closely with the Corps on all permit applications for projects occurring in navigable waters.⁸⁵ Therefore, projects occurring within critical habitat would be subject to section 7 consultation through the Corps, as described above.
103. The Corps' National Inventory of Dams identifies 227 dams located in the study area for this analysis. Exhibit 3-2 provides information on the three dams that are subject to federal regulation.

EXHIBIT 3-2. FEDERALLY REGULATED DAMS IN STUDY AREA

REGULATORY AGENCY	DAM NAME	LOCATION (COUNTY)	CRITICAL HABITAT UNIT
FERC	Elba Dam ¹	Coffee County, AL	GCM6
FERC	Gantt Dam	Covington County, AL	GCM2
FERC	Point "A" Dam	Covington County, AL	GCM1
Note: Elba Dam was exempted from licensing by FERC in 1989.			

104. Permitting and operations of these three dams are therefore subject to section 7 consultation considering potential effects on the listed mussels and critical habitat. Chapter 4 discusses the potential incremental impacts of critical habitat designation on the permitting and regulations of these dams.
105. In addition, any new dams proposed within the study area will be subject to Federal permitting by the Corps and therefore will also require section 7 consultation with the Service. There are currently three dam projects that may take place within the study area; no other dam, impoundment, or diversion activities are currently forecast to take place within the timeframe of the analysis.⁸⁶ Exhibit 3-3 provides information on these projects, and more detailed information is provided in Chapter 4.

EXHIBIT 3-3. KNOWN FUTURE DAM, IMPOUNDMENT, AND DIVERSION ACTIVITIES WITHIN STUDY AREA

PROJECT NAME	LOCATION (COUNTY)	CRITICAL HABITAT UNIT
Murder Creek	Conecuh County, AL	AP2
Shoal River	Okaloosa County, FL	GCM5
Little Choctawhatchee Reservoir	Dale and Houston Counties, AL	GCM6

⁸⁵ Personal communication with Northwest Florida Water Management District on December 13, 2011.

⁸⁶ Personal communication with the Corps' Mobile District on November 15, 2011; personal communication with Corps' Jacksonville Regulatory Division, Pensacola Section on November 7, 2011; and personal communication with the NFWFMD on November 17, 2011.

3.2.2 DREDGING, CHANNELIZATION, AND IN-STREAM MINING

106. Dredging, channelization, and in-stream mining threaten the eight mussel species by altering the hydrology of their habitats and destabilizing the stream channel through direct physical disturbance of substrates.⁸⁷ These activities are regulated by the Corps pursuant to Section 10 of the RHA and Section 404 of the CWA.
107. In the Florida counties containing proposed critical habitat for the eight mussels, dredge and fill activities are also regulated by the Environmental Resource Permit (ERP) program of the NFWFMD. However, NFWFMD works closely with the Corps on all permit applications for projects occurring in navigable waters.⁸⁸ Therefore, projects occurring within critical habitat would be subject to section 7 consultation through the Corps, as described above.
108. Dredging, channelization, and in-stream mining activities are very infrequent within the study areas in both Florida and Alabama.⁸⁹ The Corps' Mobile District has only issued one permit for this type of activity in the study area since 2001.⁹⁰ The activity was maintenance dredging for a water intake structure in Escambia County, AL (Unit GCM1) in 2009. Because the specifics of the project are unknown, it is not possible to predict with sufficient accuracy whether or not this activity would reoccur within the timeframe for this analysis.⁹¹
109. The Corps' Jacksonville District has issued eight permits for this type of activity in the study area since 2001.⁹² However, six of these permits were for "fill" projects that the District does not feel will reoccur in the future; therefore we do not project future consultations associated with these activities.⁹³ The District also issued two 404 permits for maintenance dredging work; one project occurred in Escambia County, Florida in 2008 (Unit GCM1), and the other occurred in Bay County, Florida in 2008 (Unit GCM6). According to the Corps, the Corps-maintained database where this permitting information is found, known as the Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2), is a good predictor of future Corps-permitted activity, both in terms of location and frequency.⁹⁴ Therefore, we expect that there will be two future maintenance dredging projects (and corresponding consultations) for each unit—Unit GCM1 and GCM6—over the course of the timeframe of the analysis.

⁸⁷ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁸⁸ Personal communication with NFWFMD on December 13, 2011.

⁸⁹ Personal communication with the Corps' Mobile District on November 15, 2011; Personal communication with Corps' Jacksonville Regulatory Division, Pensacola Section on November 7, 2011.

⁹⁰ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011.

⁹¹ Personal communication with Corps' Mobile District on December 12, 2011.

⁹² Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

⁹³ Personal communication with Corps' Jacksonville Regulatory District, Pensacola Section, on January 11, 2012.

⁹⁴ *Ibid.*

3.2.3 TRANSPORTATION AND UTILITIES

Transportation

110. The primary threats associated with bridge construction and maintenance activities are sedimentation, alteration of stream hydrology, and direct substrate disturbance.⁹⁵ Road construction and maintenance may increase the sediments entering the stream through normal run-off. Installation of water-based transportation structures, such as docks or boat launches, can similarly harm critical habitat.
111. ADOT and FDOT permit or conduct all State and county road and bridge construction in Alabama and Florida. ADOT and FDOT generally enter into section 7 consultation with the Service regarding the effects of these projects on listed species and critical habitats.
112. In Alabama, four of nine transportation districts overlap proposed critical habitat for the mussels. When a listed species or critical habitat is present, ADOT incorporates special environmental management practices, including heightened environmental investigative requirements, increased surveying and monitoring of the species, additional biologists onsite during construction to oversee management of the species or habitat, and, in the case of riverine habitat, construction equipment and personnel are prohibited from entering the stream. In some cases, the design of the bridge or road is altered to completely span the stream to avoid direct disturbance of the river flow or substrate.⁹⁶
113. FDOT divides Florida's roads into seven districts. FDOT's District Three includes all eight Florida counties containing proposed critical habitat. FDOT follows guidelines, developed with the Florida Fish and Wildlife Conservation Commission (FWC), for special management of construction activities "within the primary or secondary range of a listed species."⁹⁷ These guidelines require coordination between FDOT, FWC, and the Service to determine whether wildlife exclusionary structures, alternative roadway design, or other conservation efforts are necessary to protect the species.
114. In addition to road and bridge construction, in-stream work related to the installation of docks, boat launches, and other marine transportation structures threatens eight mussels habitat by altering stream hydrology and destabilizing the stream channel through direct physical disturbance of substrates. Such in-stream activity is subject to section 7 consultation, as it is permitted by the Corps pursuant to section 404 of the CWA.
115. Within the study area in Alabama, the analysis identifies the following projects that may require section 7 consultation:

⁹⁵ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

⁹⁶ Personal communication with Environmental Program Engineer, ADOT, on October 28, 2011.

⁹⁷ "Florida Department of Transportation Wildlife Crossing Guidelines," accessed at <http://www.dot.state.fl.us/emo/pubs/APPROVED-Wildlife%20Crossing%20Guidelines3-13.pdf> on December 22, 2011; personal communication with FDOT, on December 12, 2011.

- **Road and bridge construction.** ADOT's Five-Year Plan indicates that 71 road or bridge construction projects are ongoing or planned to begin construction within the next five years.⁹⁸
- **Road and bridge maintenance.** Based on the assumption that each roadway within the study area will require one maintenance project over the next 20 years, the analysis forecasts 110 maintenance projects will be carried out over the next 20 years within the study area in Alabama.⁹⁹
- **In-stream transportation construction.** The Corps issued three section 404 permits for installation of such structures between 2000 and 2010 within the study area in Alabama—one per unit in Units AP2/GCM1, GCM1, and GCM2.¹⁰⁰ Therefore, the analysis forecasts two in-stream transportation construction projects in Units AP2/GCM1, GCM1, and GCM2 over the next 20 years.

116. Within the study area in Florida, the following projects were identified:

- **Road and bridge construction.** FDOT's Five-Year Plan identifies 24 road and bridge construction projects that cross streams proposed for critical habitat in the State of Florida that are ongoing or planned to begin construction within five years. Six and 18 such projects are planned for Unit GCM5 and Unit GCM6, respectively.¹⁰¹
- **Road and bridge maintenance.** Assuming each roadway crossing a stream proposed for critical habitat will require one maintenance project in the next 20 years, we forecast 98 maintenance projects within the Florida portion of Units GCM1 (three projects), GCM5 (18 projects), and GCM6 (77 projects).¹⁰²
- **In-stream transportation construction.** The Corps issued 16 section 404 permits for installation of such structures between 2000 and 2010 within the study area in Florida. Specifically, six permits were issued for projects located in Unit GCM1; three permits were issued for projects located in Unit GCM5; and seven permits were issued for projects located in Unit GCM6.¹⁰³ Therefore, the

⁹⁸ Written communication with Environmental Program Manager, ADOT, on December 12, 2011. Conversations with ADOT and FDOT indicate that road construction activity will only result in consultation when roadways cross streams designated as critical habitat. In Alabama, however, GIS data were not available to perform an analysis to determine the number of road crossings in critical habitat. Therefore, the analysis makes the conservation assumption that all projects on roadways within the broader study area will result in section 7 consultation. This may result in an overestimate of impacts to transportation projects in Alabama.

⁹⁹ *Ibid.*

¹⁰⁰ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011.

¹⁰¹ Written communication with FDOT, on December 16, 2011. Conversations with ADOT and FDOT indicate that road construction activity will only result in consultation when roadways cross streams designated as critical habitat. In Florida, the analysis uses GIS data to determine the number of road crossings in critical habitat and forecasts road and bridge construction and maintenance projects based on these figures.

¹⁰² *Ibid.*

¹⁰³ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

analysis forecasts 12, 6, and 14 consultations associated with projects in Units GCM1, GCM5, and GCM6, respectively, over the next 20 years.

Utilities

117. Installation, construction, and maintenance of utility pipelines, including natural gas, water, and sewage pipelines, and storage facilities, including underground sequestration of natural gas in its gaseous form and above-ground tanks containing liquefied natural gas, may present a conservation threat to the mussels and their habitat through removal of riparian vegetation and direct disturbance of substrate, sedimentation, introduction of pollutants, decreased dissolved oxygen concentration, increased acidity and conductivity, and altered stream flow.¹⁰⁴ These projects may be subject to the Corps' permitting requirements under section 404 of the CWA. Common practice in the installation of pipelines to avoid section 404 permitting requirements, however, is to bury the pipeline well beneath the stream or water body.¹⁰⁵ For this reason, pipeline projects are frequently not subject to 404 permitting requirements and, absent a Federal nexus, may not undertake section 7 consultation to evaluate impacts of listed species and critical habitats. Nevertheless, the Corps identified two ongoing pipeline maintenance projects within the study area, both in Escambia County, FL, in Unit GCM1, that will require section 404 permitting.¹⁰⁶ Additionally, between 2000 and 2010, the Corps has permitted three, one, and three utility pipeline projects in the Florida portions of Units GCM1, GCM5, and GCM6, respectively.
118. In Alabama, the Corps identified 11 utility pipeline projects in the study area between 2000 and 2010—one in Unit AP2/GCM1, two in Unit GCM1, two in Unit GCM4, one in Unit GCM5, four in Unit GCM6, and one in Unit GCM7.¹⁰⁷ These projects included nine sewage pipelines, one waterline installation, and one natural gas pipeline refurbishment.
119. Another potential Federal nexus commonly associated with natural gas pipeline projects is FERC permitting, generally issued for major natural gas pipeline projects. Through a permit or “certificate” process, FERC regulates natural gas pipelines and storage facilities nationally.¹⁰⁸ There are currently two approved planned or ongoing pipeline projects in Alabama and Florida; however, both projects are located outside of the study area. Since 2009, FERC has approved seven natural gas pipeline and storage projects in Alabama and two such projects in Florida, none of which are located in counties containing proposed critical habitat.¹⁰⁹ In addition, no major FERC-permitted pipeline or natural gas storage

¹⁰⁴ 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

¹⁰⁵ Personal communication with the Geologist, Florida Bureau of Minerals and Mining, on November 11, 2011.

¹⁰⁶ Personal and written communication with the Corps, Pensacola District, on November 7, 2011.

¹⁰⁷ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011.

¹⁰⁸ Personal communication with Energy Industry Analyst, FERC, on November 16, 2011.

¹⁰⁹ FERC “Approved Pipeline Projects, 2009 to the Present,” accessed at <http://www.ferc.gov/industries/gas/industry/pipelines/approved-projects.asp> on December 29, 2011.

facilities projects are currently listed as “On the Horizon,” or expected to file for the Certificate within the next few years within the study area for this analysis.¹¹⁰

120. Future utility pipeline construction activities, however, are closely linked to the demand for transportation and storage of natural gas, which is in turn closely linked to the demand for natural gas itself. Consequently, considerable uncertainty surrounds the future level of construction of natural gas pipelines and storage facilities as, due to the recent economic downturn, significant uncertainty exists related to the long-term demand for natural gas.¹¹¹
121. Based on the best available information from FERC and the Corps, however, this analysis does not forecast activity associated with the construction of new natural gas pipelines and storage facilities within the proposed critical habitat area in the foreseeable future. The analysis forecasts maintenance projects related to existing natural gas pipelines, which occur more consistently than the construction of new structures related to natural gas. The analysis also forecasts projects related to water and sewage pipelines requiring section 404 permitting based on the historical frequency of such projects.

3.2.4 RESIDENTIAL AND COMMERCIAL DEVELOPMENT

122. The majority of the lands located in the study area is privately owned, and therefore has the potential to be developed for residential or commercial uses. Construction of residential and commercial properties within or adjacent to critical habitat may cause riparian habitat loss and degradation that could adversely affect the eight mussels.¹¹² Additionally, development may increase demand for utilities and transportation, which also constitute potential threats to the mussels.
123. Development activities on non-Federal lands within the study area that are subject to a Federal nexus and may affect listed species or critical habitats would be subject to section 7 consultation with the Service. A common Federal nexus to trigger consultation on development activities is the issuance of a section 404 permit by the Corps for activities occurring in wetland areas. The development projects described in Chapter 4 of this analysis are the only activities expected to generate section 7 consultation. Smaller development and land management projects on individual properties within the area are not expected to require Federal permits and are therefore unlikely to generate section 7 consultation.
124. In Florida, the Local Government Comprehensive Planning and Land Development Act of 1985 (codified at Chapter 163, Florida Statutes) requires local governments to develop comprehensive plans to ensure consistency with the State and Regional plans for growth

¹¹⁰ FERC “Natural Gas Storage Facilities On the Horizon,” accessed at <http://www.ferc.gov/industries/gas/indust-act/storage/horizon.pdf> on December 29, 2011.

¹¹¹ Personal communication with Energy Industry Analyst, FERC, November 16, 2011.

¹¹² *Ibid.*

management that are consistent with State and Regional plans.¹¹³ The statute intends that these plans be able to direct growth in a manner that, among other things, protects environmental resources. Therefore, county-level development plans often take into consideration the presence of listed species and their habitat.

125. The following six counties in Florida that contain proposed critical habitat have comprehensive development plans that explicitly mention listed species. The development activities described in these plans that may affect the mussels or their habitat are discussed in the incremental analysis in Chapter 4 of this report.
- a) Bay County, FL: “6.8.2: Developers of projects within or adjacent to a Strategic Habitat Area (SHA) must demonstrate through conclusive scientific evidence the presence or absence of rare, threatened or endangered species.¹¹⁴ If such species are determined to be present the developer must provide a specific conservation plan to ensure survival of the species.”¹¹⁵
 - b) Escambia County, FL: “CON 1.1.9: Endangered Species. Escambia County shall not approve a development permit if construction pursuant to the permit would threaten the life or habitat of any State of Federally listed species unless an Incidental Take permit or other approval has been granted from those States and/or Federal agencies having jurisdiction over the resource.”¹¹⁶
 - c) Holmes County, FL: “Policy 6.1: The County will require that development proposals for land containing listed species of habitats for listed species and/or endangered and threatened plant species (as identified by the Florida Natural Areas Inventory, the U.S. Fish and Wildlife Service, and the Florida Fish and Wildlife Conservation Commission) must protect these habitats or prepare a suitable alternative management plan.”¹¹⁷
 - d) Okaloosa County, FL: “Policy 3.5: The County will require that development proposals for land containing listed species or habitats of listed species and/or endangered and threatened plant species (as identified by the Florida Natural Areas Inventory, the U.S. Fish and Wildlife Service, and the

¹¹³ 2008 Florida Statutes, Title XI: County Organization and Intergovernmental Relations, Chapter 163: Intergovernmental Programs, Part II: Growth Policy, County and Municipal Planning, and Land Development Regulation. Available at <http://www.leg.state.fl.us>. Accessed on December 29, 2011.

¹¹⁴ Strategic Habitat Areas in Bay County are based on habitat areas identified by the Florida Game and Fresh Water Fish Commission as areas that “[provide] some of Florida’s rarest species with the base of habitat needed for long term persistence.” (Florida Game and Fresh Water Fish Commission, Office of Environmental Services. (1994). Closing the Gaps in Florida’s Wildlife Habitat Conservation System.)

¹¹⁵ Bay County Florida Comprehensive Plan. (2010). Bay County Planning Commission. Available at http://new.co.bay.fl.us/uploads/documents/268/file/toc_comp.pdf. Accessed on December 28, 2011.

¹¹⁶ Escambia County Florida Comprehensive Plan: 2030. (2011). Available at www.co.escambia.fl.us/Bureaus/DevelopmentServices/CompPlanLDC.html. Accessed on December 28, 2011.

¹¹⁷ Holmes County 2010 Comprehensive Plan. (2010). Available at <http://www.holmescountyfl.org/documents/HolmesCountyCompPlanPolicyDocument.pdf>. Accessed on December 28, 2011.

Florida Fish and Wildlife Conservation Commission) must protect these habitats or prepare a suitable alternative management plan.”¹¹⁸

- e) Santa Rosa County, FL: “Policy 8.1.D.2: The protection of critical habitat shall be evaluated on a site development basis. For developments on property known to support endangered or threatened species and species of special concern of plants or animals, the developer shall be required to notify the appropriate Federal, State and Regional agencies and must comply with the appropriate guidelines and laws that protect endangered or threatened species and species of special concern.”¹¹⁹
- f) Washington County, FL: “Policy 6-5: The adopted Land Development Code shall contain requirements for buffering, development setbacks, and/or provisions for protection from environmentally sensitive areas, (floodplains, and wetlands) areas of known habitat for endangered or threatened species, and from major managed areas. These requirements shall include... (c) Establishing standards for identification and protection of other isolated environmentally sensitive areas (location of endangered/protected species, etc.) on a site by site basis and subject all development to site plan review which shall be the primary means for insuring protection.”¹²⁰

- 126. We discuss the potential for critical habitat to generate additional requirements under county plans and regulations in Chapter 4.
- 127. Unlike Florida, Alabama does not require that counties develop local comprehensive plans. The State does not consider critical habitat or listed species in its regulation of development projects, but instead relies on the Corps’ regulatory authority.¹²¹ Therefore, only development that is subject to 404 permitting will undergo section 7 consultation.
- 128. The study areas in Alabama and Florida can be characterized as mostly rural, largely undeveloped lands. An analysis of population density and change in population between 2000 and 2010 reveals that the counties are relatively sparsely populated and have experienced little growth over the past decade (see Exhibit 4-4). For comparison, in 2010 the average persons per square mile in the State of Florida in 2010 was 351, and in Alabama was 94. For the counties in the study area, the average persons per square mile was 88. In 2010, the average percent change in population from 2000 to 2010 in Florida was approximately 18 percent, and in Alabama was approximately seven percent, whereas the average for the study area was five percent. Three counties in the study area—Washington, FL; Santa Rosa, FL; and Walton, FL—experienced a growth rate of

¹¹⁸ Okaloosa County 2020 Comprehensive Plan. (2009). Available at http://www.co.okaloosa.fl.us/dept_growth_mgmt_comp_plans.html. Accessed on December 28, 2011.

¹¹⁹ Santa Rosa County Comprehensive Plan 2008-2025. (2008). Santa Rosa County Board of Commissioners. Available at www.santarosa.fl.gov/zoning/compplan.html. Accessed on December 28, 2011.

¹²⁰ Washington County Comprehensive Plan. 2010. Washington County Planning Commission and Washington County Planning Office. Available at <http://www.washingtonfl.com/planning/Comp%20Plan/Comp%20plan.htm>.

¹²¹ Personal communication with City of Dothan Planning & Development Department on December 14, 2011.

greater than 15 percent between 2000 and 2010. According to the Santa Rosa County Community Planning, Zoning, and Development Division, the bulk of this growth occurred in the coastal areas of the counties, outside of the study area.¹²² Half of the remaining counties experienced less than ten percent growth, and the remainder had no growth or declined in population. In addition, only one major city—Dothan, Alabama—is located within the range of the study area (in Unit GCM6).

EXHIBIT 3-4. RESULTS OF DEMOGRAPHIC ANALYSIS OF COUNTIES CONTAINING PROPOSED CRITICAL HABITAT

STATE	COUNTY	PERSONS PER SQUARE MILE (2010)	2010 POPULATION	PERCENT CHANGE IN POPULATION (2000 TO 2010)
Alabama	Lowndes	16	11,299	-16
Alabama	Wilcox	13	11,670	-11
Alabama	Bullock	18	10,914	-7
Alabama	Conecuh	16	13,228	-6
Alabama	Barbour	31	27,457	-5
Alabama	Monroe	23	23,068	-5
Alabama	Butler	27	20,947	-2
Alabama	Escambia	41	38,319	0
Alabama	Covington	37	37,765	0
Florida	Escambia	453	297,619	1
Alabama	Crenshaw	23	13,906	2
Alabama	Dale	90	50,251	2
Alabama	Geneva	47	26,790	4
Florida	Okaloosa	194	180,822	6
Alabama	Henry	31	17,302	6
Florida	Jackson	54	49,746	6
Florida	Holmes	42	19,927	7
Alabama	Pike	49	32,899	11
Florida	Bay	223	168,852	14
Alabama	Houston	175	101,547	14
Alabama	Coffee	74	49,948	15
Florida	Washington	43	24,896	19
Florida	Santa Rosa	150	151,372	29
Florida	Walton	53	55,043	36
AVERAGE		88		5

¹²² Personal communication with the Santa Rosa County Community Planning, Zoning, and Development Division on December 7, 2011.

129. These growth trends, coupled with the recent economic downturn, have resulted in very low overall levels of development activity across the study area. While smaller development projects may occur within the study area, there are very few that are significant enough to require 404 permitting.¹²³ Known future development projects that are anticipated to lead to section 7 consultation are summarized in Exhibit 3-5 and discussed in greater detail in Chapter 4.
130. In addition to the specific projects listed in Exhibit 3-5, other projects are anticipated to occur in in the study area based on historical trends reflected in Corps permitting records.¹²⁴ These projects are summarized in Exhibit 3-6 and discussed in greater detail in Chapter 4.

EXHIBIT 3-5. KNOWN FUTURE DEVELOPMENT PROJECTS WITHIN STUDY AREA¹²⁵

CRITICAL HABITAT UNIT	PROJECT TYPE	LOCATION (COUNTY)
GCM5	Residential	Walton County, FL
GCM5	Residential	Santa Rosa County, FL
GCM6	Residential	Walton County, FL
GCM6	Residential	Washington County, FL
GCM6	Commercial	Washington County, FL
GCM6	Commercial	Washington County, FL

¹²³ Personal communication with the Corps' Mobile District on December 12, 2011.

¹²⁴ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

¹²⁵ Personal communication with the Walton County Planning and Development Services on December 6, 2011; personal communication with the Santa Rosa County Community Planning, Zoning, and Development Division on December 7, 2011; and personal communication with the Washington County Planning Department on December 6, 2011.

EXHIBIT 3-6. PROJECTED DEVELOPMENT ACTIVITY BASED ON HISTORICAL TRENDS¹²⁶

CRITICAL HABITAT UNIT	PROJECT TYPE	LOCATION (COUNTY)
AP1	Commercial	Monroe County, AL
AP2/GCM1	Commercial	Escambia County, AL
AP2/GCM1	Commercial	Houston County, AL
GCM5	Commercial	Okaloosa County, FL
GCM6	Commercial	Coffee County, AL
GCM6	Commercial	Houston County, AL
GCM6	Commercial	Houston County, AL
GCM6	Commercial	Walton County, FL
GCM7	Commercial	Pike County, AL

3.2.5 TIMBER MANAGEMENT, AGRICULTURE, AND GRAZING

131. The majority of silviculture, agriculture, and grazing operations within the study area occur on private lands in Alabama and Florida.¹²⁷ As previously stated in this report, 95 percent of lands in the study area are private.¹²⁸ Silviculture practices are frequent within the counties containing proposed critical habitat in both States.¹²⁹ Alabama contains 22.7 million acres of timberland, third-most among the contiguous 48 States, accounting for 68 percent of the total land area in the State. Within the study area, most forest tracts are either Loblolly-Shortleaf Pine or Longleaf Pine. The forestry industry is Alabama's largest manufacturing industry, with approximately 650 active forest products manufacturing operations whose revenues amounted to \$15.39 billion worth of products in 2005.¹³⁰ Alabama counties containing critical habitat produced approximately 31 percent of Alabama's total pulpwood output in 2005.¹³¹ Florida timberlands totaled 15.6 million acres in 2005, yielding about 20 million green tons of annual removals.¹³² In the

¹²⁶ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

¹²⁷ Personal and written communication with State Forester, AFC, on December 15, 2011; personal communication with Director of Responsible Forestry, FFA, on December 15, 2011.

¹²⁸ Protected Areas Database (PAD-US), CBI Edition 1.1

¹²⁹ Personal and written communication with State Forester, AFC, on December 15, 2011; personal communication with Director of Responsible Forestry, FFA, on December 15, 2011.

¹³⁰ Alabama Forestry Commission. "Alabama Forest Facts," accessed at http://www.forestry.state.al.us/forest_facts.aspx on December 28, 2011.

¹³¹ Johnson, T. and Steppleton C. "Southern Pulpwood Production, 2005." US Forest Service, June 2007.

¹³² Florida Forestry Association. "Forest Resources," accessed at http://www.floridaforest.org/facts_resources.php on December 28, 2011.

same year, Florida counties containing proposed critical habitat contributed approximately 22 percent of Florida's pulpwood production.¹³³ Within the study area, 51 percent of land is categorized as timberland, 11 percent as grassland or pastureland of low intensity management mostly used for livestock grazing, and 7.2 percent as agricultural lands used for the production of crops.¹³⁴

132. Silviculture production poses threats to the eight mussels and their habitat due to associated sedimentation, pesticide use, and direct substrate disturbance through road construction. Although silviculture, agriculture, and grazing operations on private lands are not normally federally-regulated or permitted activities, the possibility exists for these operations to require Federal permits or receive Federal funding. Several activities commonly associated with silviculture operations, including forest road construction, could potentially require section 404 permitting from the Corps. Silviculture, agriculture, and grazing projects may also receive Federal funding through Natural Resource Conservation Service (NRCS) programs, such as the Environmental Quality Incentive Program (EQIP) and Wildlife Habitat Incentive Program (WHIP). In these cases, the activities may be subject to section 7 consultation regarding potential effects on listed species and habitats.

Section 404 Permitting

133. Silviculture operations in Alabama are regulated at the State level by the Alabama Forestry Commission (AFC), which was established and mandated by Code of Alabama, 1975, Section 9-3-4 (1), to protect, conserve, and increase the timber and forest resources of the State of Alabama.¹³⁵ The Florida Forestry Association (FFA) and the Florida Forest Service (FFS), which were created under the Florida Department of Agriculture and Consumer Services, are two organizations that regulate silviculture operations in the State.¹³⁶ AFC and FFS maintain Best Management Practices (BMPs) for silviculture operations. The level of compliance with BMPs is high in both States.¹³⁷ Compliance is monitored using areal imaging and random on-the-ground site visits.¹³⁸
134. Alabama's BMPs for forestry are non-regulatory guidelines, suggested to help Alabama's forestry community maintain and protect the physical, chemical and biological integrity of waters of the State of Alabama. Florida's forestry BMPs aim to protect and maintain the State's water quality as well as wildlife habitat values, during forestry activities. Both States' BMPs contain similar protections, including minimization of road length and

¹³³ Johnson, T. and Steppleton C. "Southern Pulpwood Production, 2005." US Forest Service, June 2007; 22 percent by standard chord produced, 19 percent by green ton produced.

¹³⁴ National Land Cover Database 2006. Accessed at <http://www.mrlc.gov/> on December 20, 2011.

¹³⁵ Alabama Forestry Commission, *Alabama's Best Management Practices for Forestry*. 2007.

¹³⁶ Personal and written communication with State Forester, AFC, on December 15, 2011; personal communication with Director of Responsible Forestry, FFA, on December 15, 2011; Florida Forest Service, "Silviculture Best Management Practices," 2011. Accessed at <http://www.fl-dof.com/index.html> on December 20, 2011.

¹³⁷ Public comments of the National Council For Air And Stream Improvement, Inc. submitted on December 6, 2011.

¹³⁸ Personal communication with Director of Responsible Forestry, FFA, on December 15, 2011; personal communication with State Forester, AFC, on December 29, 2011.

width, stabilization of road banks and critical road segments, and special treatment of stream crossings, including the use of bridges and culverts.¹³⁹ The States' BMPs provide some level of baseline protection for the mussels, but do not require surveying and monitoring of the species or riparian buffers, as have previously been requested by the Service for freshwater mussel species in section 7 consultations addressing timber management, agriculture, and grazing.¹⁴⁰

135. Silviculture, farming, or ranching practices in Alabama and Florida are also subject to mandatory BMPs set forth by the Corps. These BMPs require that the silviculture, farming, and ranching activities:

1. Are not part of an activity whose purpose is to convert a wetland into an upland;
2. Are part of an established (i.e. ongoing) silvicultural, farming or ranching operation and not a new use to which the wetland was not previously subject;
3. Use "normal" silvicultural, farming or ranching activities as defined by the Corps (described below);
4. Have not lain idle for so long that hydrological modifications will be necessary to resume operations;
5. Do not contain any toxic pollutant listed under Section 307 of the Clean Water Act.¹⁴¹

136. The Corps' BMPs define "normal" silviculture, farming, or ranching activities to be compliant if:

1. Permanent roads, temporary access roads and skid trails (all for forestry) in waters of the U.S. shall be held to the minimum feasible number, width, and total length consistent with the purpose of specific silvicultural operations, and local topographic and climatic conditions;
2. All roads, temporary or permanent, shall be located sufficiently far from streams or other water bodies (except for portions of such roads which must cross water bodies) to minimize discharges of dredged or fill material into waters of the U.S.;
3. The road fill shall be bridged, culverted or otherwise designed to prevent the restriction of expected flood flows;

¹³⁹ Florida Forest Service, "Silviculture Best Management Practices," 2011. Accessed at <http://www.fl-dof.com/index.html> on December 20, 2011.

¹⁴⁰ U.S. Fish and Wildlife Service. "PCFO Stream Crossing Conservation Measures for Mussels" provided by the U.S. Fish and Wildlife Service to Industrial Economics, Inc. on September 7, 2011; Water Resource Associates, Inc. 2006. Draft Technical Report: MFL Establishment for the Upper Santa Fe River. Prepared for the Suwannee River Water Management District in association with SDII Global, Janicki Environmental and Intera, Inc. December 2006.

¹⁴¹ Alabama Forestry Commission, *Alabama's Best Management Practices for Forestry*. 2007.

4. The fill shall be properly stabilized and maintained during and following construction to prevent erosion;
5. In designing, constructing and maintaining roads, vegetative disturbance in the waters of the U.S. shall be kept to a minimum;
6. The design, construction and maintenance of the road crossing shall not disrupt the migration or other movement of those species of aquatic life inhabiting the water body;
7. Borrow material shall be taken from upland sources whenever feasible;
8. The discharge shall not take, or jeopardize the continued existence of a threatened or endangered species as defined under the Endangered Species Act, or adversely modify or destroy the critical habitat of such species.¹⁴²

The protections put forth in the Corps' BMPs listed above provide baseline conservation for the eight mussels.

137. Silviculture, farming, and grazing projects could still be subject to section 7 consultation if the project were subject to 404 permitting. However, as described below, it is not likely that such activities would be subject to a Federal nexus due to 404 permitting.
138. As the requirements of the Corps' BMPs are designed to protect water quality, wildlife, and wildlife habitat during silviculture, farming, and grazing operations, the CWA allows for certain exemptions from section 404 permitting for compliant operations. Construction of roads near or affecting streams or other navigable waters is often subject to section 404 permitting. However, road construction involved in silviculture, farming, and ranching operations is exempt from section 404 permitting requirements under section 404(f) of the CWA if the operation adheres to the BMPs listed above.¹⁴³ Section 404(f) of the CWA, "provides that discharges that are part of normal farming, ranching, and forestry activities associated with an active and continuous ("ongoing") farming or forestry operation generally do not require a Section 404 permit. ... To be exempt, these activities must be part of an established, ongoing operation. For example, if a farmer has been plowing, planting and harvesting in wetlands, he can continue to do so without the need for a Section 404 permit, so long as he does not convert the wetlands to dry land. Activities which convert a wetland which has not been used for farming or forestry into such uses are not considered part of an established operation, and are not exempt."¹⁴⁴ "Normal" operations is defined as "activities such as plowing, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices (Section 404(f)(1)(A))."¹⁴⁵

¹⁴² *Ibid.*

¹⁴³ Personal and written communication with State Forester, AFC, on December 15, 2011; personal communication with Director of Responsible Forestry, FFA, on December 15, 2011.

¹⁴⁴ U.S. EPA, "Memorandum: Clean Water Act Section 404 Regulatory Program And Agricultural Activities," accessed at <http://water.epa.gov/lawsregs/guidance/wetlands/cwaag.cfm> on December 20, 2011.

¹⁴⁵ *Ibid.*

139. In both States, the natural landscape has been comprehensively cultivated for so long that there is little chance for a forestry operation to begin anew such that it would not satisfy the definition of “ongoing.” Satisfaction of the definition of “normal” operations depends on the nature of the operation and, as stated above, must not “convert the wetlands to dry land.” FFA, FFS and AFC have not within the last 20 years encountered a case when a silviculture operation was not exempt from 404 permitting requirements in Florida and Alabama, respectively. Besides section 404 permits, no other Federal permits are required for silviculture operations.¹⁴⁶ Thus, it is unlikely that section 404 permitting will provide a Federal nexus for silviculture operations, and this analysis does not anticipate any impacts to silviculture operations from section 7 consultations triggered by section 404 permits.
140. Nevertheless, officials at AFC note that some potential future regulations could create a circumstance in which silviculture operations are no longer exempt from 404 permitting requirements or are otherwise subject to a Federal nexus.¹⁴⁷ The EPA in recent years has proposed guidance to expand the definition of the term “Waters of the United States” to include more water bodies than “Traditional Navigable Waters.” Relevant case law includes *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) and *Rapanos v. United States*, 546 U.S. 1162 (2006). AFC believes the broadening of these terms would lead to regulation of additional water bodies, which could in turn lead to increased permitting requirements for silviculture operations under section 404 of the CWA.
141. Additionally, a more recent court ruling in the Ninth Circuit, *Northwest Environmental Defense Center v. Brown*, redefines road construction and other common practices associated with silviculture operations as sources of point-source pollution, as opposed to non-point source pollution, as previously defined.¹⁴⁸ This has the potential to increase permitting requirements for silviculture operations in States within the Ninth Circuit, because several common forestry practices, when defined as sources of point-source pollution, are no longer exempted from USACE and NPDES permitting requirements under section 404(f) exemptions. Although Alabama and Florida are outside of the Ninth Circuit, AFC expressed concern that this ruling could be applied in those States at some point in the future, which would increase permitting requirements for silviculture operations in these States, creating the potential for a Federal nexus for silviculture operations.¹⁴⁹
142. Considerable uncertainty surrounds these rulings and whether they will in fact change the permitting requirements for silvicultural operations in Alabama and Florida within the next 20 years. It follows that the likelihood for these activities to be subject to section 7 consultation considering the mussels and their habitat is likewise uncertain. The potential

¹⁴⁶ Personal and written communication with State Forester, AFC, on December 15, 2011; personal communication with Director of Responsible Forestry, FFA, on December 15, 2011.

¹⁴⁷ Personal and written communication with State Forester, AFC, on December 15, 2011.

¹⁴⁸ *Northwest Environmental Defense Center v. Marvin Brown*, 640 F.3d 1063 (9th Cir. 2010).

¹⁴⁹ Personal and written communication with State Forester, AFC, on December 15, 2011.

for critical habitat designation to generate additional conservation for these species in the case that a Federal nexus is present is discussed in Chapter 4.

NRCS Funding

143. In addition to section 404 permitting requirements, silviculture operations, as well as agricultural and grazing operations, can be subject to a Federal nexus through Federal funding from NRCS's EQIP and WHIP programs. Through these programs, NRCS provides funds for private operations to implement more than 100 farming practices, such as brush management, stream channel bed stabilization, irrigation systems, and weed control, among many others, all aimed at improving the natural environment for both farming operations and wildlife habitat.¹⁵⁰
144. EQIP and WHIP are popular programs in both Alabama and Florida.¹⁵¹ In Florida counties containing critical habitat, EQIP and WHIP provided more than 700 contracts to farmers in each year since 2009.¹⁵² Between 1996 and 2008, Alabama's EQIP program provided more than 2,900 contracts in Alabama counties containing critical habitat. Between 2002 and 2008, WHIP awarded nearly 500 contracts in Alabama counties containing critical habitat.¹⁵³ Because of the abundance of projects subject to this Federal nexus, NRCS officials in Alabama and Florida have undertaken statewide programmatic consultations with the Service to develop "consultation matrices," which allow NRCS to minimize the number of section 7 consultations required each year. The programmatic consultations with the Service provide guidance for the types of practices, landscapes, and listed species that have the potential to affect listed species and habitats, such as construction of access roads, brush management, channel bed stabilization, dams, diversions, and irrigation systems, prescribed burns, stream crossings, and stream habitat restoration, among others. The NRCS in both States pursues alternative practices that minimize the potential for projects to adversely affect listed species and habitats and thereby minimize the need for project-specific section 7 consultation.¹⁵⁴
145. In Florida, NRCS funded projects have never triggered formal section 7 consultation related to freshwater mussels, due in large part to the conservation-oriented nature of the projects and streamlined administrative efforts associated with the programmatic consultation.¹⁵⁵ When the consultation matrix developed between the Service and NRCS suggests that a practice may affect a listed mussel species, NRCS has addressed the potential issue with the Service outside of section 7 consultation "through informal discussions [and] field visits, when necessary, and avoidance measures have been

¹⁵⁰ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011; personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

¹⁵¹ *Ibid.*

¹⁵² Written communication with Assistant State Conservationist for Financial Assistance Programs, Florida NRCS, on December 19, 2011.

¹⁵³ Written communication with Resource Conservationist, Alabama NRCS, on December 20, 2011.

¹⁵⁴ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011; personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

¹⁵⁵ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011.

implemented within the conservation plans.” NRCS states that, “the consultation matrix system, co-developed by USFWS and NRCS, has been shown to streamline the implementation of conservation on the ground and improve water quality critical to the mussels and their habitat.”¹⁵⁶ Any project modifications associated with “avoidance measures ... implemented within the conservation plans” would be considered baseline impacts because the Service would request them for the listing of the species regardless of critical habitat designation. The statewide programmatic consultation is re-initiated and revised annually with the Service.

146. Under the guidance of the newly implemented programmatic consultation matrix over the last year, Alabama NRCS representatives have only entered into a single section 7 consultation, which did not consider freshwater mussel species. Based on this short history of consultation and the level of consultation effort in other states implementing similar consultation matrices, Alabama NRCS anticipates very few future section 7 consultations related to freshwater mussels.¹⁵⁷ However, because the consultation matrix was implemented so recently in Alabama, considerable uncertainty surrounds the potential future level of administrative burden for Alabama NRCS officials.¹⁵⁸ Similar to Florida, the programmatic consultation between the Service and Alabama NRCS is revised and re-initiated on an annual basis.

3.2.6 OIL WELLS/DRILLING

147. Due to their reduced range and small population sizes, the eight mussel species are vulnerable to the threat of contaminant spills associated with oil and natural gas drilling and production operations. Oil and natural gas wells are subject to periodic spills either directly at the well site or as a result of transporting the oil. Numerous highways and railroads cross the stream channels, making spills as a result of transportation accidents another constant potential threat.
148. Oil and natural gas drilling operations seldom have a Federal nexus, as the vast majority occur on private lands and do not require Federal permits or funds.¹⁵⁹ Thus, activity related to oil and natural gas wells are not likely to be subject to section 7 consultation considering the mussels and their habitat. Emergency spill response efforts, however, have the potential to involve the Service when a spill occurs in an area containing listed species or critical habitat.
149. Spill response in Alabama is carried out by ADEM’s Emergency Response Program. In the case of a spill in areas occupied by listed species or containing critical habitat, ADEM notifies the Service of the spill either directly or through the Alabama Department of

¹⁵⁶ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011

¹⁵⁷ *Ibid*; personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

¹⁵⁸ Personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

¹⁵⁹ Personal communication with Geologist, Florida Bureau of Minerals and Mining, on November 11, 2011.

Conservation and Natural Resources. However, this situation has not occurred and ADEM has never consulted with the Service related to emergency response activity.¹⁶⁰

150. In Florida, the FDEP's Department of Law Enforcement's Bureau of Emergency Response (BER) carries out spill response activities. BER notifies the Service through the Florida State Fish and Wildlife Commission in the event of a catastrophic spill in areas containing listed species or critical habitat. BER has never entered section 7 consultation with the Service in the past 20 years.¹⁶¹ BER notes that spills in areas containing critical habitat or listed species would be temporally prioritized over another equal spill that did not contain listed species or critical habitat, but spill response procedures would not change as a result of listed species or critical habitat.
151. The lack of section 7 consultations regarding emergency spill response across not only the study area for this analysis, but the States as a whole, suggests that it is rare that spill activity would generate the need for consultation on the eight mussel species and their habitat. Additionally, although spills present a threat to the species, significant uncertainty surrounds the frequency and location of spills related to oil well operations, making it difficult to predict the potential timing and location of future spills. Chapter 4 of this report describes the potential effect of critical habitat for the eight mussels on the outcome of a spill response consultation in the case that this occurs in the future.

¹⁶⁰ Personal communication with Manager of Decatur Field Office, ADEM, former Alabama Emergency Response Program Manager, on November 14, 2011.

¹⁶¹ Personal communication with Emergency Response Specialist, Law Enforcement Branch, Bureau of Emergency Response, FDEP on December 9, 2011.

CHAPTER 4 | INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION FOR THE EIGHT MUSSELS

152. This chapter evaluates the potential for critical habitat designation to result in additional (“incremental”) conservation for the eight mussels. Section 4.1 summarizes the results of the incremental analysis. Section 4.2 discusses, by activity, forecast consultations and projects subject to Service review with respect to eight mussels conservation. Section 4.3 concludes with a description of key assumptions and caveats that generate uncertainty regarding the estimated incremental impacts.

4.1 SUMMARY OF RESULTS OF THE INCREMENTAL IMPACT ANALYSIS

153. The first key conclusion of this analysis is that the types of conservation efforts requested by the Service during section 7 consultations regarding the eight mussels are not expected to change due to critical habitat designation. As stated in the incremental effects memorandum, the Service believes that “in most cases, the results of consultation under the adverse modification and jeopardy standards are likely to be similar because... the primary constituent elements that define critical habitat are also essential for the survival of the eight mussels.”¹⁶² In addition, the Service anticipates that the conservation efforts it would recommend to avoid jeopardy to any one of the species would be the same conservation efforts it would recommend to avoid jeopardy or adverse modification of critical habitat for any of the other mussel species.¹⁶³ While each of the eight mussel species does not occur in each of the nine units, every unit is occupied by at least one mussel species. Therefore, we anticipate that critical habitat designation will not generate additional requests for project modification in any of the proposed critical habitat units.

154. The second key conclusion is that there are no indirect incremental impacts for any of the activity categories considered in this analysis. Based on discussions with State and local regulatory authorities, including ADEM, FDEP, and NFWFMD, land and water management practices are not expected to change due to the designation of critical habitat.¹⁶⁴

¹⁶² US Fish and Wildlife Service, Incremental Effects Memorandum, July 15, 2011. See Appendix D.

¹⁶³ Email communication from the Service’s Atlanta, GA Field Office to Industrial Economics, October 12, 2011.

¹⁶⁴ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; Personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011; personal communication with the Northwest Florida Water Management District on December 14, 2011.

KEY ISSUES AND CONCLUSIONS OF THE INCREMENTAL ANALYSIS

Incremental Impacts of Critical Habitat Designation

- Incremental impacts of critical habitat designation are limited to additional administrative costs of consultations. The Service expects that conservation measures implemented to avoid jeopardy to the species (anticipated to be undertaken regardless of critical habitat designation) are sufficiently protective to avoid adverse modification of critical habitat. Thus no additional conservation measures are likely to be requested due to critical habitat designation for the species.
- The present value impacts of critical habitat designation in areas proposed for designation over the next 20 years (2012 through 2031) are \$1,700,000, or \$150,000 on an annualized basis, assuming a seven percent discount rate.

Incremental Impacts by Activity

- Water Quality Management. 3.5 informal and .5 formal consultations in Alabama and 6.5 informal consultations in Florida are expected to occur annually associated with the development of new or revised water quality criteria. In addition, one formal consultation is expected to occur every three years in each state associated with triennial review of water quality standards.
- DOD Land Management. One formal consultation is expected to occur annually for review of the Naval Air Station (NAS) Whiting Field's Integrated Natural Resource Management Plan (INRMP).
- Impoundments, Dams, and Diversions. Three formal consultations are expected to occur within the study area over the next 20 years. These consultations are associated with known future projects that will require Corps permits.
- Dredging, Channelization, and In-Stream Mining. Two formal consultations are expected to occur within the study area (in Unit GCM1 and GCM6) over the next 20 years. These consultations are projected based on historical permitting activity provided by the Corps' Jacksonville District.
- Transportation and Utilities. Within the next five years, 95 section 7 consultations related to new road and bridge construction activity are expected within the study area. Over the next 20 years, 208 consultations are expected in association with road and bridge maintenance and resurfacing projects. While the total number of forecast consultations is high and may represent an overestimate of administrative effort, ADOT and FDOT expect that they will involve a low level of effort due to their repetitive nature. The majority of activity is expected to occur within units GCM1 and GCM6, as these units include areas of Florida that are more heavily developed with roadways than the rest of the study area. No road or bridge construction activity is expected within Units AP2/GCM1 and GCM2. Thirty-eight consultations associated with in-stream transportation and 36 consultations on utilities projects are expected over 20 years within the study area based on historical activity levels.
- Commercial and Residential Development. There are six known development projects that are expected to occur within the study area in the timeframe of the analysis and result in section 7 consultation with the service. In addition, there have been nine major development projects in the study area within the past ten years that required Corps permitting. This level of activity is expected to continue into the future, and therefore 18 consultations are expected to occur over the next 20 years in the study area (nine every ten years).
- Timber Management, Agriculture, and Grazing. As these activities are exempt from section 404 permitting under section 404(f) of the CWA, no consultations are expected to result from section 404 permitting requirements for these activities. NRCS funding also serves as a Federal nexus for these activities, but consultations on individual projects are not expected due to streamlined section 7 processes associated with recent statewide NRCS programmatic consultations in both States. One formal consultation is expected per year in each State in association with annual revision and reinitiation of the NRCS programmatic consultations in each State.
- Oil Wells/Drilling. As no relevant Federal nexus exists for operation of oil wells, the only potential impacts are those associated with oil spill response activities. However, no section 7 consultations are expected related to response actions in the study area in the future.

Incremental Impacts by Unit

- Over 20 years, we anticipate Units GCM1 and GCM6 will experience the greatest incremental impacts, followed by Units GCM5 and AP1. Units GCM5 and GCM6 are subject to greater impacts related to Transportation activities, as they are located in more highly developed areas in both Florida and Alabama. Additionally, these units incur costs related to Impoundments, Dams, and Diversions by 2014. Units AP1 and GCM1 also include areas subject to consultations of development activities within the next 20 years.

155. Absent changes in conservation associated with section 7 consultation or changes in conservation behavior outside of section 7 consultation for the mussels, this chapter quantifies only incremental administrative effort to consider critical habitat as part of section 7 consultations for these species. As described in Chapter 2, once critical habitat is designated, some additional effort is likely to be required as part of section 7 consultation to describe the potential for projects to result in adverse modification. This is reflected in additional hours spent in communication with the Service and on activities such as report-writing and project documentation.
156. Exhibit 4-1 summarizes the forecast incremental impacts by proposed critical habitat unit.

EXHIBIT 4-1. TOTAL ESTIMATED INCREMENTAL IMPACTS BY UNIT (PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	20-YEAR IMPACTS (2012-2031)	
	PRESENT VALUE	ANNUALIZED
AP1	\$134,000	\$11,800
AP2	\$97,900	\$8,630
GCM1/AP2	\$28,800	\$2,540
GCM1	\$407,000	\$35,900
GCM2	\$7,140	\$630
GCM3	\$69,900	\$6,170
GCM4	\$39,000	\$3,440
GCM5	\$198,000	\$17,400
GCM6	\$670,000	\$59,100
GCM7	\$45,000	\$3,970
TOTAL	\$1,700,000	\$150,000
Notes: Estimates are rounded to three significant digits and may not sum to totals reported due to rounding.		

157. The present value of total incremental cost of critical habitat designation is \$1,700,000 assuming a seven percent discount rate, or \$150,000 on an annualized basis. Exhibit 4-2 provides the estimated incremental impacts by activity. Transportation and Utilities activities are likely to be subject to the greatest incremental impacts at \$1,150,000 over 20 years, followed by water quality management activities at \$317,000; timber management, agriculture, and grazing activities at \$84,000; development activities at \$72,900; DOD land management activities at \$53,000; impoundments, dams, and diversions at \$13,100; and dredging, channelization, and in-stream mining at \$10,600 (present values over 20 years assuming a seven percent discount rate). No incremental impacts to oil wells and drilling operations are anticipated.

EXHIBIT 4-2. ESTIMATED INCREMENTAL IMPACTS BY ECONOMIC ACTIVITY (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

ACTIVITY	PRESENT VALUE	ANNUALIZED
Transportation and Utilities	\$1,150,000	\$101,000
Water Quality Management	\$317,000	\$28,000
Residential and Commercial Development	\$72,900	\$6,430
Timber Management, Agriculture, and Grazing	\$84,000	\$7,410
DOD Land Management	\$53,000	\$4,670
Impoundments, Dams, and Diversions	\$13,100	\$1,160
Dredging, Channelization, and In-Stream Mining	\$10,600	\$935
Oil Wells and Drilling	\$0	\$0

4.2 SECTION 7 CONSULTATION FORECAST

Direct Incremental Impacts

158. As discussed in Chapter 1, this analysis focuses on the following threats to critical habitat: (1) Impoundments, Dams, and Diversions; (2) Dredging, Channelization, and In-Stream Mining; (3) Transportation (roads, bridges, in-stream work) and Utilities; (4) Residential and Commercial Development; (5) Timber Management, Agriculture, and Grazing; and (6) Oil Wells and Drilling.
159. This analysis applies the best available information in order to forecast the likely frequency and geographic distribution of projects subject to section 7 consultation within the study area. Information referenced to identify future activity levels included public comments submitted on the Proposed Rule, agency planning documents (e.g., development and transportation plans), and communication with Federal and State agencies such as the Corps, NRCS, FERC, Departments of Transportation, the Service, and State and local government officials.
160. In some cases, specific information on the location and frequency of future projects was not available. In these instances, we relied on historical information describing activity levels in combination with discussions with the relevant permitting or regulatory agency. For example, as described in Chapter 3, a number of the activities evaluated in this analysis are subject to CWA section 404 permitting. The Corps maintains the ORM2 database, a web-based geospatial database application for tracking and managing all aspects of the Corps regulatory process. The ORM2 database facilitates the processing and documentation of permit applications and enforcement activities overseen by the regulatory program by creating, storing and tracking all permit application data and related information in a single system.
161. The Corps' Mobile District and the Corps' Jacksonville District, Pensacola Section, provided ORM2 data for the years 2001 to present.¹⁶⁵ Although ORM2 contains current

¹⁶⁵ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information

and historical records of Corps permitting activities in the areas containing proposed critical habitat, based on conversations with the Corps we acknowledge that the data may be incomplete because many users are not vigilant about recording permitting activities in the database. However, the Corps believes that the database is a good predictor for Corps-permitted activities for the future both in terms of location and frequency of activities.¹⁶⁶

¹⁶⁷ This analysis therefore relies on this database as the best available information to forecast consultations on 404-permitted projects across the study area, along with interviews and information collected by other relevant parties to supplement the ORM2 data, where possible.¹⁶⁸

162. The remainder of this section describes the consultation forecasts for each of the affected land- and water-use activities. Direct incremental impacts associated with these forecast consultations are assumed to be limited to administrative costs because the Service does not anticipate recommending additional conservation efforts to avoid adverse modification over and above those recommended to avoid jeopardy to the species, and because all units are occupied by one or more of the mussel species.¹⁶⁹ Once critical habitat is designated, some additional effort is likely to be required as part of section 7 consultation to describe the potential for projects to result in adverse modification. This is reflected in additional hours spent in communication with the Service and on activities such as report-writing and project documentation.

Indirect Incremental Impacts

163. In addition to the direct incremental impacts of critical habitat designation, potential exists for indirect impacts: that is, impacts of the designation that may occur outside of the section 7 consultation process. State or local regulations may require conservation of eight mussels based on the presence of critical habitat. In conversations with State and local governments, including ADEM and FDEP, the designation of critical habitat does not influence management practices related to State regulations above the level of conservation required by the presence of the species.¹⁷⁰
164. NFWMD is one of five water management districts in Florida created by the Water Resources Act of 1972. The District serves all the counties in Florida that contain proposed critical habitat for the eight mussels. Several permitting programs are implemented District-wide, including programs for the construction and repair of dams; agricultural, forestry, and wetland projects; and an ERP program, which regulates activities occurring in, on or over wetlands or other surface waters.

Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

¹⁶⁶ Personal communication with the Corps' Mobile District on December 13, 2011.

¹⁶⁷ Personal communication with the Corps' Jacksonville District, Pensacola Section, on January 11, 2012.

¹⁶⁸ For very small projects recorded in the database as receiving permits from the Corps, we assume that the Corps would these projects unlikely to affect the species or their critical habitats and would not consult with the Service. Therefore, we do not predict future consultations for these activities.

¹⁶⁹ US Fish and Wildlife Service, Incremental Effects Memorandum, July 15, 2011. See Appendix D.

¹⁷⁰ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; Personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011

165. In permitting activities, the District takes into consideration the impact of a project on listed species. Specifically, Section 10.2.2 of the Applicant's Handbook states:

...an applicant must provide reasonable assurances that a regulated activity will not impact the values of wetland and other surface water functions so as to cause adverse impacts to: (a) the abundance and diversity of fish, wildlife and listed species; and (b) the habitat of fish, wildlife and listed species.¹⁷¹

Whenever the District undertakes the permitting of a project that occurs in, on or over surface waters, however, it automatically alerts the Corps, regardless of the presence of listed species or critical habitat.¹⁷² The Corps would then consult with the Service as appropriate under section 7. Therefore, although the District would incur administrative costs due to the listing of new species, these costs would be considered "baseline" costs because they would occur regardless of the presence of critical habitat.

4.2.1 WATER QUALITY MANAGEMENT

166. Relevant to a number of the evaluated activities, the analysis identifies potential incremental administrative effort related to section 7 consultation occurring between EPA and the Service during EPA reviews of Alabama and Florida State water quality standards. As described in Chapter 3, when ADEM and FDEP promulgate changes to State water quality standards, EPA Region 4 consults with the Service to ensure that the new or revised water quality standards are sufficiently protective of listed species.¹⁷³ In Alabama, the promulgation of new or revised water quality standards, and associated consultation between the Service and the EPA, occurs roughly one to five times per year.¹⁷⁴ In Florida, these consultations occur roughly six to seven times per year.¹⁷⁵ These consultations are generally informal. In addition, ADEM consults annually with EPA Region 4 on all of its water quality standards, which results in one additional consultation annually. These consultations are either formal or informal based on the number of water quality standards that have changed over the course of the year. EPA Region 4 estimates that half of its consultations associated with annual reviews of the Alabama's entire water quality standards are formal consultations; the remainder is informal consultations.¹⁷⁶
167. We therefore forecast 3.5 informal consultations in Alabama and 6.5 in Florida annually associated with the development of new or revised water quality criteria. As these

¹⁷¹ *Applicant's Handbook Volume I, Section 10.2.2*. 2010. Northwest Florida Water Management District. Available at <http://www.nwfwmd.state.fl.us/permits/erp/erp_downloads.htm>.

¹⁷² Personal communication with the Northwest Florida Water Management District on December 14, 2011.

¹⁷³ Personal communication with State Water Quality Standards Coordinator, EPA Region 4, on November 9, 2011; personal communication with State Water Quality Standards Coordinator, EPA Region 4, State Water Quality Standards Coordinator, on November 8, 2011.

¹⁷⁴ Personal communication with ADEM, on October 12, 2011.

¹⁷⁵ Personal communication with EPA Region 4, Water Quality Standards Coordinator, on November 9, 2011 and December 14, 2011.

¹⁷⁶ Personal communication with ADEM, on October 12, 2011; personal communication with EPA Region 4, Coordinator of Alabama Water Quality Standards, on November 8, 2011.

consultations are relevant to all proposed critical habitat stream segments, we distribute the administrative costs of considering critical habitat for the eight mussels across the proposed units based on the number of river miles within each unit.

168. EPA Region 4 also engages in triennial reviews with ADEM and FDEP in which all State water quality standards are evaluated to determine consistency with aquatic species and human health needs. With each triennial review, EPA Region 4 enters into formal consultation with the Service.¹⁷⁷
169. We therefore forecast one formal consultation every three years in each State, amounting to seven formal consultations in each State over the next 20 years associated with triennial review of water quality standards. Administrative costs of considering critical habitat for the eight mussels are likewise distributed across the proposed units based on the number of river miles within each unit.
170. Incremental administrative costs associated with these consultations amount to \$317,000 over the next 20 years (using a seven percent discount rate), or \$28,000 on an annualized basis. Units GCM1, GCM5, and GCM6 are expected to incur the highest share of these costs, as these units cross the Alabama-Florida border, and costs from consultations between EPA Region 4 and both ADEM and FDEP are represented in these units.
171. ADEM and FDEP do not treat critical habitat differently than areas that are not designated but are occupied by listed species. In the case of the eight mussels, since all proposed critical habitat units are occupied by one or more of the eight mussels, ADEM and FDEP confirm that the presence of the species, not critical habitat, would be responsible for any changes in water quality standards.¹⁷⁸ Furthermore, as the entire critical habitat is occupied by the species, ADEM and FDEP do not expect the presence of critical habitat to generate additional considerations in decisions to designate water bodies to special classifications, such as section 303(d) Impaired Waters, OAWs, OFWs, or any other use-classification. That is, critical habitat would not generate additional scrutiny above and beyond the presence of the listed mussel species in assigning special use-classifications. In the event that a stream were added to a State's section 303(d) list or another special designation due to, at least in part, the presence of listed mussel species, the change in water quality standards would be considered a baseline effect of the listing of the species.¹⁷⁹

4.2.2 DOD LAND MANAGEMENT

172. Two properties managed by the Department of the Navy occur within the study area: the Naval Air Station (NAS) Whiting Field's Navy Outlying Landing Field (NOLF) Evergreen and NOLF Pace. NOLF Evergreen falls within the study area for Unit AP2, and NOLF Pace falls within the study area for Unit GCM1. The NAS's Integrated Natural Resources Management Plan (INRMP) is subject to annual review with the

¹⁷⁷ Personal communication with EPA Region 4, State Water Quality Standards Coordinator, on November 9, 2011; personal communication with EPA Region 4, State Water Quality Standards Coordinator, on November 8, 2011.

¹⁷⁸ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; Personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011.

¹⁷⁹ *Ibid.*

Service and the State, "...to ensure that it remains an effective tool to promote the continued sustainability of the installations ecosystems."¹⁸⁰ We assume that the Service's annual review of this plan will be in the form of formal consultation each year. This consultation would be triggered by the listing of the eight mussels, regardless of the designation of critical habitat. However, incremental administrative effort may be required to consider the impact of activities covered under the INRMP on eight mussels critical habitat. We therefore forecast one formal consultation annually for the next 20 years associated with review of the INRMP. Because the Service does not anticipate critical habitat designation to result in recommendations for conservation efforts beyond those it would recommend due to the listing of the species, we expect that incremental economic impacts of critical habitat associated with consultation on the NAS's INRMP are limited to additional administrative effort. Incremental administrative costs associated with the projected consultations amount to \$53,000 over the next 20 years (assuming a seven percent discount rate), or \$4,670 on an annualized basis. These costs are split evenly between Unit AP2 and Unit GCM1, as one NOLF falls within each unit and both areas are covered by the INRMP.

4.2.3 IMPOUNDMENTS, DAMS, AND DIVERSIONS

173. As described in section 3.2.1, 227 dams occur within the study area; these dams include small, privately owned projects that are not regulated as well as larger dams that generate power or create impoundments. Existing dams for which there is a Federal nexus (those that are either permitted by FERC or managed by the Department of Defense) are described in detail below, in addition to proposed future projects that will subject to CWA 404 permitting by the Corps.
174. All other dams included in the National Inventory are not anticipated to be subject to Federal regulatory action. These other dams do not generate hydropower and are therefore not subject to periodic re-permitting by FERC, as described in Chapter 2. It is likely that their initial construction was permitted by the Corps according to 404 requirements, however these permits are not subject to renewal and therefore there is no additional Federal oversight absent a change in operations at the projects.¹⁸¹ In addition, the designation of critical habitat for the eight mussels is not expected to trigger a consultation with the Service.¹⁸²
175. In order to forecast section 7 consultations for impoundment, dam, and diversion projects in the study area, we spoke with the Service, the Corps, and the NFWMD and reviewed public comments submitted to the Federal Register in response to the Proposed Rule. Exhibit 4-3 summarizes the total incremental administrative costs related to impoundment, dam, and diversion projects by unit within the study area. Exhibit 4-4 describes the forecast consultations in greater detail.

¹⁸⁰ Letter from Department of the Navy, Commander Navy Region Southeast to the U.S. Fish and Wildlife Service, "Critical Habitat for the Alabama PearlsheIl, Round Ebonyshell, Southern Sandshell, Southern Kidneyshell, Chactaw Bean, Narrow Pigtoe, and Fuzzy Pigtoe," December 1, 2011.

¹⁸¹ Personal communication with Corps' Mobile District on December 13, 2011.

¹⁸² *Ibid.*

EXHIBIT 4-3. INCREMENTAL IMPACTS TO DAMS, IMPOUNDMENTS, AND DIVERSIONS (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE (DISCOUNTED AT SEVEN PERCENT)	ANNUALIZED (DISCOUNTED AT SEVEN PERCENT)
AP1	\$0	\$0
AP2	\$4,370	\$386
AP2/GCM1	\$0	\$0
GCM1	\$0	\$0
GCM2	\$0	\$0
GCM3	\$0	\$0
GCM4	\$0	\$0
GCM5	\$4,370	\$386
GCM6	\$4,370	\$386
GCM7	\$0	\$0
TOTAL	\$13,100	\$1,160

Note: Estimates may not sum to the totals reported to rounding.

EXHIBIT 4-4. SUMMARY OF KNOWN FUTURE DAM, IMPOUNDMENT, AND DIVERSION ACTIVITIES SUBJECT TO INCREMENTAL IMPACTS

UNIT	PROJECT NAME	PROJECT DESCRIPTION	CONSULTATION TYPE	CONSULTATION YEAR
AP2	Murder Creek	Proposed dam project	Formal	2012-2014
GCM5	Shoal River	Proposed reservoir project	Formal	2013
GCM6	Little Choctawhatchee Reservoir	Proposed water supply reservoir project	Formal	2012-2014

Existing Projects

176. Three hydropower dams exist within study area.¹⁸³ The PowerSouth Energy Cooperative owns and operates two of the facilities, Point A and Gantt, which are located in the study areas of units GCM1 and GCM2, respectively, on the main stem of the Conecuh River in Covington County, AL. The dams are known as the “Conecuh River Project,” and are licensed jointly by FERC. The Conecuh River Project’s current FERC license was issued on June 22, 2006 and will expire on May 31, 2036. Because the expiration date occurs beyond the timeframe for this analysis, we do not include the forecast consultation in our analysis, even though we do expect one to occur in 2036. While this consultation is anticipated to occur beyond the timeframe of this analysis, we expect critical habitat

¹⁸³ Federal Energy Regulatory Commission. (2011). “FERC: Hydropower.” Available at <http://www.ferc.gov/industries/hydropower.asp>. Accessed on December 29, 2011.

designation to generate relatively minor incremental administrative effort and not to affect the operations or management of the project.

177. FERC's licensing process for the project included an Environmental Assessment (EA), which considered impacts to another threatened species, the Gulf sturgeon (*Acipenser oxyrinchus desotoi*), whose critical habitat occurs immediately downstream of the Point A dam of the Conecuh River Project. The Service responded to the EA on October 21, 2005, and stated that the project, as proposed, is not likely to adversely affect the Gulf sturgeon or its critical habitat, provided that the project, as proposed, will result in continuous minimum flows through the dam and that the releases from the Point A dam meet State water quality standards. The Service's response stipulates that they reserve the right to recommend to FERC that a re-initiation of section 7 consultation take place in the future if they determine that project operations are having a negative downstream impact to the Gulf sturgeon. Therefore, based on current standards required by FERC for the operation of the Conecuh River Project, including agreed-upon measures for flows and lake levels; biological monitoring and adaptive management; and water quality monitoring, further impacts resulting from the designation of critical habitat for the eight mussels are unlikely.¹⁸⁴
178. The Elba Dam, owned by Elba Hydro-Electric Power Inc., is located in the study area of unit GCM6. It was constructed in 1903 for power generation but is no longer in use. On September 15, 1989, the dam was exempted from licensing by FERC.¹⁸⁵ Article 2 of their exemption requires them to comply with the terms and conditions set for the project by Federal and/or State fish and wildlife agencies determined appropriate to protect fish and wildlife resources.¹⁸⁶ As the dam is no longer in use, however, we do not expect any future consultations to occur due to the designation of critical habitat.

Proposed Projects

179. The Murder Creek project is a proposed dam construction project in Conecuh County, Alabama. The goal of the project is to create a 2,650-acre lake on Murder Creek which would be used as a source of water for local agriculture and Bio-fuel operations, as well as for public recreation.¹⁸⁷ According to the Corps' Mobile District, this project is currently stalled due to lack of funding; if funding is obtained, however, the project may move forward.¹⁸⁸ Because the project's timeframe is unknown, for purposes of this analysis we operate under the conservative assumption that the project moves forward within the next three years.

¹⁸⁴ Personal communication with the Service, January 3, 2012.

¹⁸⁵ Exemptions from Licensing. Federal Energy Regulatory Commission. Available at <http://www.ferc.gov/industries/hydropower/gen-info/licensing/exemptions.asp>. Accessed on December 29, 2011.

¹⁸⁶ FERC Issuance 19890921-0206. "Order granting exemption from licensing (5 MW or less) and dismissing with prejudice application for preliminary permit (Issued September 15, 1989)." Available through FERC Online eLibrary (elibrary.ferc.gov), accessed December 28, 2011.

¹⁸⁷ Department of the Army, Mobile District, Corps of Engineers, Public Notice No. SAM-2007-0289-MNS: Proposed Filling/Impounding of Water of the U.S. in Conjunction with the Construction of a Dam to Create a Reservoir on Murder Creek, Conecuh County, Alabama.

¹⁸⁸ Personal communication with the Corps' Mobile District on November 15, 2011.

180. The Shoal River project is a small reservoir project being proposed by the NFWFMD and Okaloosa County, Florida. According to the Corps' Mobile District, this project has replaced an earlier project known as the "Yellow River project."¹⁸⁹ The proposed reservoir is intended to be an off-line reservoir that would provide storage for water withdrawn from the Shoal River. This project is in the very early stages of development; project leaders are still determining if the property needed for the reservoir can be acquired.¹⁹⁰ For purposes of this analysis, we assume that the project moves forward within the next three years.
181. The Little Choctawhatchee Project is a proposed water supply reservoir project in Dale and Houston Counties, Alabama.¹⁹¹ The Choctawhatchee, Pea & Yellow Rivers Watershed Management Authority has applied for a section 404 permit from the Corps, intending to construct a regional water supply reservoir to provide a municipal water source to serve Houston, Dale, Coffee, and Geneva Counties.¹⁹² While this project is also in need of funding, it is anticipated that it will move forward.¹⁹³ Therefore, we assume that the project will occur within the next three years.
182. As described in Chapter 2, the Service's incremental memorandum indicates that conservation efforts recommended through section 7 consultation to avoid adverse modification of critical habitat will most likely match those requested to avoid jeopardy.¹⁹⁴ We therefore anticipate that incremental economic impacts to these dam projects will be limited to additional administrative costs.

4.2.4 DREDGING, CHANNELIZATION, AND IN-STREAM MINING

183. Dredging, stream channelization, and in-stream mining alter stream hydrology and degrade water quality through sedimentation. Disposal of dredged material into proposed critical habitat can alter or destroy substrate through direct, in-stream disturbance. In-stream gravel mining degrades water quality through sedimentation, potentially alters stream hydrology, and destroys substrate through direct, in-stream disturbance.
184. According to the Corps' Mobile and Jacksonville Districts, very little dredging, channelization, or in-stream mining activity occurs within the proposed critical habitat for the eight mussel species.¹⁹⁵ Any activities that do occur, however, would result in section 7 consultation (either formal or informal) with the Service due to the presence of the mussel species and critical habitat.

¹⁸⁹ *Ibid.*

¹⁹⁰ Personal communication with the Northwest Florida Water Management District on November 17, 2011.

¹⁹¹ Department of the Army, Mobile District, Corps of Engineers, Public Notice No. SAM-2008-1781-JSC: Proposed Water Supply Reservoir in Dale and Houston Counties, Alabama.

¹⁹² *Ibid.*

¹⁹³ Personal communication with the Corps' Mobile District on November 15, 2011.

¹⁹⁴ U.S. Fish and Wildlife Service to Industrial Economics, Inc. July 15, 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical habitat for Eight Southeastern Mussels." See Appendix D.

¹⁹⁵ Personal communication with Corps' Jacksonville Regulatory Division, Pensacola Section on November 7, 2011; Personal communication with the Corps' Mobile District on November 15, 2011.

EXHIBIT 4-5. INCREMENTAL IMPACTS TO DREDGING, CHANNELIZATION, AND IN-STREAM MINING ACTIVITIES (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE	ANNUALIZED
GCM1	\$5,300	\$467
GCM6	\$5,300	\$467
TOTAL	\$10,600	\$935
Note: Estimates may not sum to totals reported due to rounding.		

Dredging & Channelization

185. As described in Chapter 3, the Mobile District's ORM2 database records indicated that one permit was issued between 2001 and 2011 for maintenance dredging for a water intake structure in Escambia County, AL (Unit GCM1) in 2009.¹⁹⁶ However, because the specifics of the project are unknown, it is not possible to predict with sufficient accuracy whether or not this activity would reoccur within the timeframe for this analysis.¹⁹⁷
186. The Jacksonville District's ORM2 database records indicated that eight permits were issued for this type of activity between 2001 and 2011 in the proposed critical habitat areas in Florida. However, six of the permitted projects are not expected to reoccur and therefore we do not project future consultations for these projects.¹⁹⁸ Two maintenance dredging projects, however, are expected to reoccur in the future.¹⁹⁹ One of these projects took place in Bay County, FL (Unit GCM1) and the other took place in Escambia County, FL (Unit GCM6).²⁰⁰ Because the database is considered a good predictor of future Corps-permitted activities, we expect that two future consultations will occur in each of these units within the timeframe for the analysis.²⁰¹

In-Stream Mining

187. Sand and gravel mining was once common in northwest Florida and southern Alabama, but has become very infrequent in modern times, either because all the deposits have been mined or because of environmental prohibitions.²⁰² According to the Jacksonville Regulatory Division, Pensacola Section, there has not been sand and gravel mining activity in at least 15 years.²⁰³ In addition, the ORM2 database records from both the Mobile District and the Jacksonville District did not contain reports of any mining

¹⁹⁶ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011.

¹⁹⁷ Personal communication with Corps' Mobile District on December 12, 2011.

¹⁹⁸ Personal communication with Corps' Jacksonville Regulatory District, Pensacola Section, on January 11, 2012.

¹⁹⁹ *Ibid.*

²⁰⁰ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

²⁰¹ Personal communication with the Corps' Jacksonville District, Pensacola Section, on January 11, 2012.

²⁰² Personal communication with Corps' Jacksonville Regulatory Division, Pensacola Section on November 7, 2011.

²⁰³ *Ibid.*

activity in the past 10 years.²⁰⁴ Therefore, we do not expect this activity to result in any future consultations.

4.2.5 TRANSPORTATION AND UTILITIES

188. As described in Section 3.5.3, construction of roads, bridges, in-stream transportation structures, and utility pipelines has the potential to impact eight mussel species and their critical habitat through direct disturbance of habitat during construction or through increased run-off from paved or gravel roads once construction is complete. Any such project occurring within the study area is likely to incur incremental administrative costs associated with the consideration of critical habitat during section 7 consultation. As previously stated, incremental project modifications due to the designation of critical habitat are not anticipated. Exhibit 4-6 describes total incremental administrative costs related to transportation and utilities activity by unit within the study area.

EXHIBIT 4-6. INCREMENTAL IMPACTS TO TRANSPORTATION AND UTILITY ACTIVITY (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE	ANNUALIZED
AP1	\$121,000	\$10,600
AP2	\$60,700	\$5,360
AP2/GCM1	\$10,600	\$935
GCM1	\$288,000	\$25,400
GCM2	\$5,300	\$467
GCM3	\$56,600	\$5,000
GCM4	\$26,700	\$2,360
GCM5	\$112,000	\$9,900
GCM6	\$446,000	\$39,400
GCM7	\$18,800	\$1,660
TOTAL	\$1,150,000	\$101,000

Note: Totals may not sum due to rounding.

Road and Bridge Construction

189. The majority of section 7 consultations related to transportation and utilities projects are expected to involve road and bridge construction projects. Using Five-Year Plans from ADOT and FDOT, this analysis forecasts planned or ongoing road and bridge construction projects located within the study area and describes the geographical and temporal distribution of consultation costs related to these projects within the next five years.²⁰⁵ The analysis also assumes one maintenance project will be required on a 20-year

²⁰⁴ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

²⁰⁵ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

cycle for each roadway occurring within the study area.²⁰⁶ It is expected that one formal consultation will result from each planned or ongoing road or bridge construction project included in ADOT's and FDOT's Five-Year plans, as well as from each maintenance or resurfacing project. Outside of routine resurfacing and maintenance occurring on a 20-year cycle, considerable uncertainty surrounds the frequency and location of future DOT construction activity beyond five years.²⁰⁷ Therefore, this analysis does not attempt to forecast future projects beyond five years for projects other than routine maintenance or resurfacing projects assumed to occur once on each road in the study within 20 years.

190. Over the next 20 years, a total of 303 section 7 consultations are expected in association with road and bridge construction and maintenance projects. Within the next five years, 95 consultations related to new road and bridge construction activity are expected within the study area. Over the next 20 years, 208 consultations are expected in association with maintenance and resurfacing projects. Conversations with ADOT and FDOT indicate that road construction activity will only result in consultation when roadways cross streams designated as critical habitat.²⁰⁸ In Alabama, however, GIS data were not available to determine the number of road crossings in critical habitat. Therefore, we make the conservative assumption in Alabama that all projects on roadways within the broader study area will result in section 7 consultation. This is likely to result in an overestimate of impacts to transportation projects in Alabama. As GIS data were available in Florida, we rely on GIS data to determine the number of road crossings in critical habitat and forecast road and bridge construction and maintenance projects based on these figures. While the total number of forecast consultations is high and may represent an overestimate of administrative effort, ADOT and FDOT expect that they will involve a low level of effort due to their repetitive nature.²⁰⁹ Most consultations on road and bridge construction and maintenance will likely be routine informal consultations. Efforts will likely consist of verifying that construction is compliant with BMPs, appropriate measures are taken to protect water quality, and direct disturbance of habitat is kept to a minimum.²¹⁰
191. The majority of activity is expected to occur within units GCM1 and GCM6, as these units include areas of Florida that are more heavily developed with roadways than the rest of the study area. No road or bridge construction activity is expected within Units AP2/GCM1 and GCM2. Exhibit 4-7 describes the distribution of forecast section 7 consultations associated with road and bridge construction projects within the study area.

²⁰⁶ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁰⁷ *Ibid.*

²⁰⁸ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

²⁰⁹ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²¹⁰ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

EXHIBIT 4-7. FORECAST SECTION 7 CONSULTATIONS ASSOCIATED WITH BRIDGE AND ROAD CONSTRUCTION ACTIVITY (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	PROJECTS INDICATED IN ADOT, FDOT 5-YEAR PLANS	MAINTENANCE OR RESURFACING EXPECTED ON 20-YEAR CYCLE	TOTAL
AP1	6.5	35.5	42
AP2	9	9	18
AP2/GCM1	0	0	0
GCM1	27.5	38.5	66
GCM2	0	0	0
GCM3	8	9	17
GCM4	2	3	5
GCM5	8	20	28
GCM6	32	91	123
GCM7	2	2	4
TOTAL	95	208	303

Sources: Written communication with Erica Strong, ADOT, on December 12, 2011; written communication with James Krolick, Grimail Crawford, Inc., GIS contractor for FDOT, on December 9, 2011 and December 15, 2011.

In-Stream Transportation Structures

192. The ORM2 database from the Corps' Mobile District indicates that only three section 7 consultations have been carried out in Alabama over the last ten years related to in-stream transportation construction projects within the study area—one in Unit AP2/GCM1, one in Unit GCM1, one in Unit GCM2—and no known projects, planned or ongoing, currently exist within the study area.²¹¹ Based on the historical frequency of such projects in Alabama, the analysis assumes two section 7 consultations will occur in each of these three units at some point over the next 20 years related to in-stream transportation construction projects within the study area in Alabama.
193. Over the last 10 years in the Florida portion of the study area, the ORM2 database from the Corps' Pensacola District identified six, three, and seven projects related to in-stream transportation in Units GCM1, GCM5, and GCM6, respectively. No known ongoing or planned projects were identified in these areas.²¹² Based on these historical levels of activity, the analysis anticipates 12, six, and 14 consultations will occur in Units GCM1, GCM5, and GCM6, respectively, at some point over the next 20 years related to in-stream transportation within the Florida portion of the study area.

²¹¹ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Mobile District Contractor on November 22, 2011.

²¹² Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corp of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

Utilities

194. As previously described in Section 3.5.3 of this report, no major pipeline construction activity has been licensed by FERC within the study area since 2009, and no such projects are in the planning or construction stages.^{213,214} Considerable uncertainty surrounds the level of future construction of natural gas pipelines and storage facilities due to several factors, including uncertainty of level of demand for natural gas.
195. The ORM2 database from the Corps' Mobile District indicates that 11 pipeline maintenance projects have occurred within the study area in Alabama and seven such projects in Florida over the past ten years.²¹⁵ The Corps, which permits pipeline-related activity, especially maintenance, believes the ORM2 database to be an accurate predictor of Corps-permitted activity within the study area.²¹⁶ Therefore, 18 future consultations are expected to occur in the study area every ten years, as presented in Exhibit 4-8. In addition, two pipeline maintenance projects are currently ongoing in Escambia County, FL.²¹⁷ The analysis expects one formal section 7 consultation to occur in association with each of these projects. Exhibit 4-8 provides information on the geographic and temporal distribution of these projects.
196. The frequency and location of future natural gas construction projects are highly uncertain. As a result, based on the best available information from FERC and the Corps, this analysis does not forecast activity associated with the construction of new natural gas pipelines and storage facilities within the proposed critical habitat area in the foreseeable future. While this may represent an underestimate of the level of utility activity within the study area, we still expect relatively minor administrative costs due to critical habitat designation for these projects, as it is common practice in the installation of pipelines to avoid section 404 permitting requirements to place the pipeline through a boring process well beneath the stream or water body.²¹⁸ For this reason, pipeline projects are frequently not subject to 404 permitting requirements and, absent a Federal nexus, may not undertake section 7 consultation to evaluate impacts of listed species and critical habitats.

²¹³ FERC's Approved Projects List, accessed at <http://www.ferc.gov/industries/gas/indus-act/pipelines/approved-projects.asp> on December 19, 2011.

²¹⁴ Personal communication with FERC, on November 16, 2011.

²¹⁵ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2), received from U.S. Army Corp of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

²¹⁶ Personal communication with the Corps' Mobile District on December 13, 2011.

²¹⁷ Written communication with Corps' Pensacola District on November 7, 2011.

²¹⁸ Personal communication with the Geologist, Florida Bureau of Minerals and Mining, on November 11, 2011.

EXHIBIT 4-8. UTILITY PROJECTS EXPECTED OVER THE NEXT 20 YEARS

UNIT	PROJECT NAME	PROJECT DESCRIPTION	CONSULTATION TYPE	CONSULTATION YEAR
AP2/GCM 1	3 residential sewer line projects in Conecuh County, AL	Historical (recorded in ORM2)	Formal	1 x 10 years
GCM1	2 natural gas maintenance projects in Escambia County, FL	Ongoing (identified by Corps Pensacola District)	Formal	2012
	1 natural gas maintenance project in Conecuh County, AL	Historical (recorded in ORM2)	Formal	1 x 10 years
	1 waste water pipeline project in Conecuh County, AL	Historical (recorded in ORM2)	Formal	1 x 10 years
	2 waterline projects in Escambia County, FL	Historical (recorded in ORM2)	Formal	1 x 10 years
	1 sewer line project in Escambia County, FL	Historical (recorded in ORM2)	Formal	1 x 10 years
GCM4	2 water control structure projects in Crenshaw and Pike Counties	Historical (recorded in ORM2)	Formal	2 x 10 years
GCM5	1 sewer line project in Covington County, AL	Historical (recorded in ORM2)	Formal	1 x 10 years
	1 waterline project in Walton County, FL	Historical (recorded in ORM2)	Formal	1 x 10 years
GCM6	4 Sewer line projects in Houston County	Historical (recorded in ORM2)	Formal	4 x 10 years
	1 pipeline project in Walton County, FL ¹	Historical (recorded in ORM2)	Formal	1 x 10 years
	1 natural gas pipeline project in Walton County, FL	Historical (recorded in ORM2)	Formal	1 x 10 years
	1 pipeline project in Washington County, FL ¹	Historical (recorded in ORM2)	Formal	1 x 10 years
GCM7	1 sewer line project in Pike County	Historical (recorded in ORM2)	Formal	1 x 10 years
Source: Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2), received from U.S. Army Corp of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.				
Notes:				
1. Type of pipeline project not specified in ORM2 database.				

197. The analysis does forecast maintenance projects related to existing natural gas pipelines, which occur more consistently than the construction of new structures related to natural gas. The analysis also forecasts projects related to water and sewage pipelines requiring section 404 permitting based on the historical frequency of such projects, as previously described in this section.

4.2.6 RESIDENTIAL AND COMMERCIAL DEVELOPMENT

198. As discussed in Chapter 3, permitting loads associated with development projects have been smaller than usual in recent years due to the economic downturn.²¹⁹ The ORM2 database records from the Corps' Mobile District and Jacksonville District indicate that nine large development projects requiring Corps permitting have occurred in the study area in the past decade.²²⁰ Both districts believe the ORM2 records to be good indicators of future Corps-permitted activity in the study area for the timeframe of this analysis.²²¹
199. To establish whether or not this level of activity is expected to continue in the future, and to identify any known upcoming development projects in the study area, we spoke with representatives from county planning departments counties that experienced the most growth over the past decade (Washington, Santa Rosa, and Walton), as well as the planning department in Dothan, AL, and reviewed public comments submitted in response to the Proposed Rule.²²² Absent a specific forecast of development activity within the study area, we assume that ongoing development trends indicated by the ORM2 database will continue for the foreseeable future. Exhibit 4-9 summarizes the total incremental administrative costs related to development projects by unit within the study area. Exhibit 4-10 presents more detailed information on the specific forecast consultations.

EXHIBIT 4-9. INCREMENTAL IMPACTS TO DEVELOPMENT (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE (DISCOUNTED AT SEVEN PERCENT)	ANNUALIZED (DISCOUNTED AT SEVEN PERCENT)
AP1	\$5,300	\$467
AP2	\$0	\$0
AP2/GCM1	\$10,600	\$935
GCM1	\$0	\$0
GCM2	\$0	\$0
GCM3	\$0	\$0
GCM4	\$0	\$0
GCM5	\$14,000	\$1,240
GCM6	\$37,600	\$3,320

²¹⁹ Personal communication with the Corps' Mobile District on December 12, 2011.

²²⁰ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

²²¹ Personal communication with the Corps' Mobile District on December 13, 2011; Personal communication with the Corps' Jacksonville District, Pensacola section, on January 11, 2012.

²²² Personal communication with the Walton County Planning and Development Services on December 6, 2011; with Santa Rosa County Community Planning, Zoning, and Development Division on December 7, 2011; with Washington County Planning Department on December 6, 2011; with the City of Dothan Planning and Development Department on November 16, 2011.

UNIT	PRESENT VALUE (DISCOUNTED AT SEVEN PERCENT)	ANNUALIZED (DISCOUNTED AT SEVEN PERCENT)
GCM7	\$5,300	\$467
TOTAL	\$72,900	\$6,430
Note: Estimates may not sum to totals reported due to rounding.		

EXHIBIT 4-10. SUMMARY OF KNOWN FUTURE DEVELOPMENT ACTIVITIES SUBJECT TO INCREMENTAL IMPACTS

UNIT	PROJECT NAME	PROJECT DESCRIPTION	CONSULTATION TYPE	CONSULTATION YEAR
AP1	1 commercial project in Monroe County	Historical (recorded in ORM2)	Formal	1 x 10 years
AP2/GCM1	2 commercial projects in Escambia and Houston Counties	Historical (recorded in ORM2)	Formal	2 x 10 years
GCM5	1 residential project in Walton County	Projected	Formal	2012-2014
	1 residential project in Santa Rosa County	Projected	Formal	2012-2014
	1 commercial project in Okaloosa county	Historical (recorded in ORM2)	Formal	1 x 10 years
GCM6	4 commercial projects in Houston, Coffee, and Walton Counties	Historical (recorded in ORM2)	Formal	4 x 10 years
	1 residential project in Walton County	Projected	Formal	2012-2014
	1 residential project in Washington County	Projected	Formal	2012
	1 commercial project in Washington County	Projected	Formal	2014
	1 commercial project in Washington County	Projected	Formal	2017
GCM7	1 commercial project in Pike County	Historical (recorded in ORM2)	Formal	1 x 10 years

200. Consistent with our analysis that identified relatively low development pressure within the study area, the ORM2 data from the Corps' Mobile District and Jacksonville District revealed that very few development activities have occurred in these areas over the past decade.²²³ One project occurred in 2008 in unit AP1 associated with construction of a department store in Monroe County. Two projects occurred in 2009 in unit GCM1/AP2, one in Conecuh County and one in Escambia County, both associated with commercial developments. One commercial project was permitted in 2006 in Okaloosa County (Unit GCM5). Four commercial development projects were permitted in unit GCM6: one in

²²³ Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Mobile District Contractor on November 22, 2011; Operations & Maintenance Business Information Link (OMBIL) Regulatory Module version 2 (ORM2). Received from U.S. Army Corps of Engineers, Jacksonville District, Pensacola Section, on January 10, 2012.

2007 in Houston County, one in 2007 in Walton County; one in 2009 in Coffee County; and one in 2011 in Houston County. Finally, one commercial project was permitted in Pike County in 2011 (located in unit GCM7). Our analysis projects that each of these units (AP1, GCM1/AP2, GCM5, GCM6, and GCM7) will experience similar development trends over the next 20 years, based on the fact that the ORM2 database is considered a good predictor of future trends for Corps-permitted activities.²²⁴ Therefore, between now and 2031, two consultations are expected to occur in unit AP1; four are expected in AP2/GCM1; two are expected in GCM5; eight are expected in GCM6; and two are expected in GCM7.

201. According to the Community Planning, Zoning, and Development Division of Santa Rosa County, there is one Planned Unit Development (PUD) that falls within the study area and is expected to occur in the coming years.²²⁵ The project, Yellow River Ranch, has been approved for 1,197 units and occurs in unit GCM5, however no construction has taken place yet. Our analysis projects that a formal consultation for this project will occur at some point over the next three years.
202. According to Walton County Planning and Development Services, two PUDs are expected to occur in the next three years, one in unit GCM5 and one in unit GCM6.²²⁶ For each project, our analysis projects that a consultation will occur over the next three years.
203. According to the planning division of Washington County, three major development projects will be occurring in the near future in unit GCM6.²²⁷ It is expected that in 2012, a section 7 consultation will occur for a PUD. Another project, described as a track and recreation center, is expected to trigger a section 7 consultation in 2014. Finally, a large development known as the Knight Development is expected to trigger a consultation in 2017.
204. As described in Chapter 2, the Service's incremental memorandum indicates that conservation efforts recommended through section 7 consultation to avoid adverse modification of critical habitat will most likely match those requested to avoid jeopardy.²²⁸ We therefore anticipate that incremental economic impacts to these development projects will be limited to additional administrative costs.
205. As described in Chapter 3, several of the counties in the Florida section of the study area (including Bay County, Escambia County, Holmes County, Okaloosa County, Santa Rosa County, and Washington County) have comprehensive plans that require certain conservation efforts for development projects occurring where listed species or their critical habitat are present. Therefore, there is the potential for indirect incremental

²²⁴ Personal communication with the Corps' Mobile District on December 13, 2011; Personal communication with the Corps' Jacksonville District on January 11, 2012.

²²⁵ Personal communication with Santa Rosa County Community Planning, Zoning, and Development Division on December 7, 2011.

²²⁶ Personal communication with Walton County Planning and Development Services on December 6, 2011.

²²⁷ Personal communication with Washington County Planning Department on December 6, 2011.

²²⁸ U.S. Fish and Wildlife Service to Industrial Economics, Inc. July 15, 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical habitat for Eight Southeastern Mussels." See Appendix D.

impacts of critical habitat designation on development projects in these counties. However, because critical habitat is limited to rivers and streams, all of which are occupied, we consider it unlikely that development activities would change due to critical habitat designation above and beyond changes recommended by the Service through section 7 consultation. In addition, the Service does not anticipate recommending additional conservation efforts above and beyond those recommended to avoid jeopardy to the species.²²⁹ According to two local planning agencies, any modifications to development plans associated with endangered species would be undertaken at the recommendation of the FDEP, who has indicated that the designation of critical habitat does not influence management practices related to State regulations above the level of conservation required by the presence of the species.^{230,231} Therefore, since all proposed critical habitat units are occupied by one or more of the species, we expect that any indirect incremental impacts would be considered baseline.

4.2.7 TIMBER MANAGEMENT, AGRICULTURE, AND GRAZING

206. Silviculture production, agriculture, and grazing operations pose threats to the eight mussels and their habitat due to associated sedimentation, pesticide use, and direct substrate disturbance through road construction and livestock trampling.²³² As discussed in detail in Section 3.2.5, these operations are exempt from section 404 permitting requirements under section 404(f) of the CWA if operations comply with mandatory Corps BMPs.²³³ Therefore, the analysis does not anticipate any future consultations on timber management, agriculture, and grazing associated with section 404 permitting. The analysis does, however, forecast two consultations per year within the study area associated with NRCS funding, the other potential Federal nexus relevant to timber management, agriculture, and grazing activity.²³⁴ Exhibit 4-11 presents incremental costs of section 7 consultations associated with these activities—which are limited to reinitiation of NRCS programmatic consultations on an annual basis in both States—by unit.

²²⁹ U.S. Fish and Wildlife Service to Industrial Economics, Inc. July 15, 2011. "Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Designate Critical habitat for Eight Southeastern Mussels." See Appendix D.

²³⁰ Personal communication with Chief Officer, Water Quality Branch, ADEM, on October 12, 2011; Personal communication with Numeric Nutrient Criteria Coordinator, FDEP on October 12, 2011

²³¹ Personal communication with Washington County Planning Department on January 3, 2012; Personal communication with the Santa Rosa County Community Planning, Zoning, and Development Division on January 3, 2012.

²³² 2011 Proposed Listing and Critical Habitat Rule, 76 FR 61482.

²³³ Personal and written communication with State Forester, AFC, on December 15, 2011; personal communication with Director of Responsible Forestry, FFA, on December 15, 2011.

²³⁴ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011; personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

EXHIBIT 4-11. INCREMENTAL IMPACTS TO TIMBER MANAGEMENT, AGRICULTURE, AND GRAZING ACTIVITY (2012-2031, PRESENT VALUE, SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE (DISCOUNTED AT SEVEN PERCENT)	ANNUALIZED (DISCOUNTED AT SEVEN PERCENT)
AP1	\$2,330	\$206
AP2	\$1,780	\$157
AP2/GCM1	\$2,140	\$189
GCM1	\$17,600	\$1,550
GCM2	\$523	\$46
GCM3	\$3,760	\$331
GCM4	\$3,460	\$305
GCM5	\$11,900	\$1,050
GCM6	\$34,600	\$3,050
GCM7	\$5,910	\$521
TOTAL	\$84,000	\$7,410
Note: Totals may not sum due to rounding.		

207. NRCS's EQIP and WHIP programs are common within counties containing proposed critical habitat.²³⁵ In response to the high number of NRCS funded projects in Alabama and Florida, NRCS in both States has undergone programmatic consultations to streamline the section 7 process and reduce impacts on NRCS, the Service, and recipients of NRCS funds. As discussed in Section 3.2.5, because of the conservation-oriented nature of most NRCS funded projects and because the programmatic consultations in both States have significantly reduced the need for section 7 consultations on NRCS projects, the analysis does not anticipate future consultations on the eight mussels related to NRCS funded projects.²³⁶
208. However, each State's programmatic consultation will be re-initiated each year and revised to consider listed species and critical habitat within the States.²³⁷ Once the eight mussels are listed and critical habitat is designated, the programmatic consultations will require reinitiation to consider the eight mussels and their habitat. The analysis anticipates incremental administrative costs associated with consideration of eight mussel critical habitat during the annual reinitiation of Alabama and Florida NRCS's programmatic consultations. Therefore, we forecast one formal section 7 consultation per year in each State associated with the reinitiation of the NRCS programmatic

²³⁵ Written communication with Assistant State Conservationist for Financial Assistance Programs, Florida NRCS, on December 19, 2011; written communication with Resource Conservationist, Alabama NRCS, on December 20, 2011.

²³⁶ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011; personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

²³⁷ Personal and written communication with Conservation Biologist, Florida NRCS, on December 15, 2011; personal communication with Conservation Biologist, Alabama NRCS, on December 19, 2011.

consultations. As these consultations are relevant to all proposed critical habitat stream segments, we distribute the administrative costs of considering critical habitat for the eight mussels across the proposed units evenly. In Florida, we received specific estimates of administrative burden associated with considering critical habitat during this reinitiated consultation. In the first year after critical habitat is designated, Florida NRCS expects to spend six hours considering critical habitat in the reinitiated programmatic consultation and four hours in each subsequent reinitiation.

4.2.8 OIL WELLS/DRILLING

209. Oil and natural gas drilling operations are seldom subject to a Federal nexus, as the vast majority occur on private lands and do not require Federal permits or funds.²³⁸ As previously stated, 95 percent of lands within the study area are privately owned.²³⁹ Thus, activity related to oil and natural gas wells are not likely to be subject to section 7 consultation considering the mussels and their habitat. Emergency spill response efforts, however, have the potential to involve the Service when a spill occurs in an area containing listed species or critical habitat as they are carried out by ADEM and FDEP.
210. Based on the Proposed Rule and discussions with the Service, the Florida Bureau of Minerals and Mining, ADEM's Emergency Response Program, and FDEP's BER, any impacts to oil well and drilling and response activities resulting from eight mussel conservation efforts would be considered baseline impacts, as these impacts would occur due to the presence of a listed species regardless of the designation of critical habitat.²⁴⁰ Additionally, the lack of section 7 consultations for any species between the Service and ADEM's Emergency Response Program and FDEP's BER suggests that impacts to oil wells and drilling and emergency response efforts would be limited in the future.²⁴¹ Although spills present a threat to the species, significant uncertainty surrounds the frequency and location of spills related to oil well operations, making it difficult to predict the timing and location of future spills. Therefore, we do not quantify impacts to oil wells and drilling operations. To the extent a spill occurs and generates section 7 consultation considering the mussels, we expect some incremental administrative costs due to critical habitat would occur.

²³⁸ Personal communication with Geologist, Florida Bureau of Minerals and Mining, on November 11, 2011.

²³⁹ Protected Areas Database (PAD-US), CBI Edition 1-1

²⁴⁰ Personal communication with Geologist, Florida Bureau of Minerals and Mining, on November 11, 2011; personal communication with Manager of Decatur Field Office, ADEM, former Alabama Emergency Response Program Manager, on November 14, 2011; personal communication with Emergency Response Specialist, Law Enforcement Branch, Bureau of Emergency Response, FDEP on December 9, 2011.

²⁴¹ Personal communication with Manager of Decatur Field Office, ADEM, former Alabama Emergency Response Program Manager, on November 14, 2011; personal communication with Emergency Response Specialist, Law Enforcement Branch, Bureau of Emergency Response, FDEP on December 9, 2011.

4.3 KEY ASSUMPTIONS

211. The economic impacts presented in this chapter are based on a number of assumptions that may affect the estimates. This section presents the key assumptions and the extent to which they may lead to under- or over-estimates of the potential incremental impacts of the proposed critical habitat designation. Exhibit 4-12 presents they key assumptions made and the potential bias they introduce in the analysis.

EXHIBIT 4-12. KEY ASSUMPTIONS ASSOCIATED WITH THE ESTIMATED INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION FOR THE EIGHT MUSSELS

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Dams, Impoundments, and Diversions		
We predict consultations based on information from the Corps, FERC, and NFWFMD. We assume that this information is complete and that no other projects will occur in the study area during the timeframe of this analysis.	Unknown. May overestimate or underestimate incremental impacts.	Probably minor. This assumption affects only the estimated administrative consultation costs.
Dredging, Channelization, and In-Stream Mining		
We assume that the ORM2 database is accurate and complete.	May result in an underestimate of costs.	Probably minor. The database only contains one record of this type of activity in the past ten years, and therefore may underestimate costs. However, because the only costs associated with consultations would be administrative consultation costs, the impact to the analysis is minor.
We assume that the Corps has accurate and complete information with respect to the level of activity in the study area.	May result in an underestimate of costs.	Probably minor. Again, because the only costs associated with consultations would be administrative costs, the impact to the analysis is minor.
Transportation and Utilities		
We note that in within the study area in Florida, we assume transportation construction and maintenance activity will only require section 7 consultation on roads and bridges crossing proposed critical habitat streams.	Unknown. May overestimate or underestimate incremental impacts.	Probably minor. This assumption affects only the estimated administrative consultation costs. FDOT officials expect consultations will involve a low level of effort due to their repetitive nature. ²⁴² Most consultations on road and bridge construction and maintenance will likely be routine informal consultations. Efforts will likely consist of verifying that construction is compliant with BMPs, appropriate measures are taken to protect water quality, and direct disturbance of habitat is kept to a minimum. ²⁴³

²⁴² Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁴³ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
<p>As GIS data on roadways were unavailable in Alabama, we could not determine the number of road crossings within critical habitat. Therefore, we assume every road construction or maintenance project within the study area in Alabama will require section 7 consultation.</p>	<p>May result in an overestimate of costs.</p>	<p>Probably minor. This assumption affects only the estimated administrative consultation costs. While the total number of forecast consultations is high and may represent an overestimate of administrative effort, ADOT officials expect they involve a low level of effort due to their repetitive nature.²⁴⁴ Most consultations on road and bridge construction and maintenance will likely be routine informal consultations. Efforts will likely consist of verifying that construction is compliant with BMPs, appropriate measures are taken to protect water quality, and direct disturbance of habitat is kept to a minimum.²⁴⁵</p>
<p>We assume each bridge and roadway crossing streams proposed for critical habitat in Florida will require one maintenance project over 20 years.</p>	<p>Unknown. May overestimate or underestimate incremental impacts.</p>	<p>Probably minor. This assumption affects only the estimated administrative consultation costs. FDOT officials expect consultations will involve a low level of effort due to their repetitive nature.²⁴⁶ Most consultations on road and bridge construction and maintenance will likely be routine informal consultations. Efforts will likely consist of verifying that construction is compliant with BMPs, appropriate measures are taken to protect water quality, and direct disturbance of habitat is kept to a minimum.²⁴⁷</p>

²⁴⁴ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁴⁵ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

²⁴⁶ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁴⁷ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
<p>We assume each roadway within the study area in Alabama will require one maintenance project over 20 years.</p>	<p>May result in an overestimate of costs.</p>	<p>Probably minor. This assumption affects only the estimated administrative consultation costs. While the total number of forecast consultations is high and may represent an overestimate of administrative effort, ADOT officials expect they involve a low level of effort due to their repetitive nature.²⁴⁸ Most consultations on road and bridge construction and maintenance will likely be routine informal consultations. Efforts will likely consist of verifying that construction is compliant with BMPs, appropriate measures are taken to protect water quality, and direct disturbance of habitat is kept to a minimum.²⁴⁹</p>
<p>We note that considerable uncertainty surrounds DOTs' plans to construct new roads beyond Five-Year Plans. Therefore, we do not forecast DOT activity beyond five years after the designation besides routine maintenance and resurfacing, occurring on a 20-year cycle.</p>	<p>May result in an underestimate of costs.</p>	<p>Probably minor. Again, because the only costs associated with consultations would be administrative costs, the impact to the analysis is minor. DOT officials expect consultations will involve a low level of effort due to their repetitive nature.²⁵⁰</p>
<p>We make the conservative assumption that every consultation on road and bridge construction will be formal.</p>	<p>May result in an overestimate of costs.</p>	<p>Probably minor. This assumption affects only the estimated administrative consultation costs. While the total number of forecast consultations is high and may represent an overestimate of administrative effort, ADOT and FDOT expect they involve a low level of effort due to their repetitive nature.²⁵¹ Most consultations on road and bridge construction and maintenance will likely be routine informal consultations. Efforts will likely consist of verifying that construction is compliant with BMPs, appropriate measures are taken to protect water quality, and direct disturbance of habitat is kept to a minimum.²⁵² However, in order to capture all potential costs of consultations, the analysis makes the conservative assumption that all consultations will be formal.</p>

²⁴⁸ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁴⁹ Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

²⁵⁰ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁵¹ Personal communication with Environmental Program Manager, ADOT, on October 28, 2011; personal communication with FDOT, on October 26, 2011.

²⁵² Written communication with Environmental Program Manager, ADOT, on December 12, 2011; written communication with FDOT, on December 16, 2011.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
In all units, we use the Corps' Mobile District's ORM2 database to assess historical trends for in-stream transportation structure activities. We then use this information to predict future trends in the units.	Unknown. May overestimate or underestimate incremental impacts.	Probably minor. This assumption affects only the estimated administrative consultation costs.
We do not quantify costs associated with construction of new natural gas pipeline and storage facilities, due to considerable uncertainty surrounding the demand for such services in the future.	May result in an underestimate of costs.	Probably minor. This assumption affects only the estimated administrative consultation costs. Additionally, little historical activity exists related to construction of new natural gas pipelines or storage facilities within the study area. No major natural gas pipeline or storage facility projects are ongoing or are in the planning stages within the counties containing proposed critical habitat.
In all units, we use the Corps' Mobile District's ORM2 database to assess historical trends for activity related to utility pipeline construction (except for natural gas pipelines) and maintenance (including natural gas pipelines). We then use this information to predict future trends in the units.	Unknown. May overestimate or underestimate incremental impacts.	Probably minor. This assumption affects only the estimated administrative consultation costs.
Commercial and Residential Development		
In Units AP1, AP2/GCM1, GCM6, and GCM7 we use the Corps' Mobile District's ORM2 database to assess historical trends for development activities. We then use this information to predict future trends in the units.	Unknown. May overestimate or underestimate incremental impacts, depending on whether the economy improves and demand for new development improves.	Minor. This assumption affects only the estimated administrative consultation costs.
One consultation will occur per developable parcel.	Unknown. May overestimate or underestimate incremental impacts.	Minor. This assumption affects only the estimated administrative consultation costs.
We assume that counties will not modify development practices due to critical habitat designation (outside of section 7 consultation) since development projects are not likely to take place within the streams and rivers proposed for critical habitat. However, the extent to which they may change their practices is largely unknown.	May result in an underestimate of costs.	Probably minor. We consider it very unlikely that critical habitat would result in substantial costs to development projects over and above those resulting from the presence of listed species.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Timber Management, Agriculture, and Grazing		
We note that NRCS funding has not previously required section consultation on any freshwater mussels within the study area. We assume that in the future, the eight mussels and their critical habitat will also not require section 7 consultation.	May result in an underestimate of costs.	Probably minor. This assumption affects only the estimated administrative consultation costs. As common practice is to address potential "May Adversely Affect" scenarios informally outside of section 7 consultation, NRCS officials do not expect future consultation on the eight mussels.
We assume the annual reinitiation of the Alabama NRCS statewide programmatic consultation and the Florida NRCS statewide programmatic consultation with the Service will result in one formal section 7 consultation per year in each State to evaluate the effect of NRCS activities on the eight mussels and critical habitat.	Unknown. May overestimate or underestimate incremental impacts.	Probably minor. This assumption affects only the estimated administrative consultation costs, and forecast levels of administrative burden associated with this assumption are low.
Because of section 404(f) exemptions applicable to timber management, agriculture, and grazing operations, we assume these activities will not require section 404 permits. Thus, no future section 7 consultation will be triggered by section 404 permitting for these activities in Alabama and Florida for the eight mussels.	May result in an underestimate of costs.	Probably minor. This assumption affects only the estimated administrative consultation costs. Although current regulation under the CWA exempts silviculture, farming, and grazing operations from section 404 permitting, recent court rulings have called such exemptions into question in the Ninth Circuit. Some AFC and FFA officials expressed concern that similar rulings could eliminate section 404(f) exemptions in Alabama and Florida in the future. In addition, AFC officials have expressed concern that a growing trend of Federal incentive programs that provide funding to silviculture operations for production of woody biomass for fuel could provide a Federal nexus for silviculture operations in the future.
We assume that NRCS and section 404 permits are the only relevant Federal nexuses for timber management, agriculture, and grazing operations within the study area.	May result in an underestimate of costs.	Probably minor. This assumption affects only the estimated administrative consultation costs. Additional Federal nexuses are unlikely for these silviculture, agriculture, and grazing activities within the study area because they primarily occur on private lands.
Oil Wells/Drilling		
We note that the majority of oil well/drilling operations occur on private lands, 95 percent of land in the study area is privately owned, and oil wells/drilling normally do not require Federal funding or permitting. Therefore, we assume no relevant Federal nexuses for drilling and well operations exist within the study area.	May result in an underestimate of costs.	Probably minor. This assumption affects only the estimated administrative consultation costs.

ASSUMPTION/SOURCE OF UNCERTAINTY	DIRECTION OF POTENTIAL BIAS	LIKELY SIGNIFICANCE WITH RESPECT TO ESTIMATED IMPACTS
Although indirect impacts to ADEM and FDEP emergency spill response activities are possible, ADEM and FDEP have not consulted with the Service on such activities in the past. Therefore we assume that no consultations will result from the listing of the species or critical habitat.	May result in an underestimate of costs.	Probably minor. The only impacts on response activities are changes in the priority of the response actions, and these changes result in no additional effort. We note that any such impacts would be baseline impacts, anyway. In addition, the agencies' response actions have never resulted in section 7 consultation in the last 20 years.

4.4 ECONOMIC BENEFITS OF CRITICAL HABITAT DESIGNATION FOR THE EIGHT MUSSELS

212. The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species. Thus, attempts to develop monetary estimates of the benefits of this proposed critical habitat designation would focus on the public's willingness to pay to achieve the conservation benefits to eight mussels resulting from this designation.
213. Quantification and monetization of species conservation benefits requires information on the incremental change in the probability of eight mussel conservation that is expected to result from the designation. As described in this chapter and previously in Chapter 3, modifications to future projects are unlikely beyond the baseline given the extensive baseline protections already provided to the species and the characteristics of the specific projects projected to occur over the 20-year timeframe of the analysis.
214. Other benefits may also be achieved through designation of critical habitat. For example, the public may hold a value for habitat conservation, beyond its willingness to pay for conservation of a specific species. Studies have been done that estimate the public's willingness to pay to preserve wilderness areas, for wildlife management and preservation programs, and for wildlife protection in general. These studies address categories of benefits (e.g., ecosystem integrity) that may be similar to the types of benefits provided by critical habitat, but do not provide values that can be used to establish the incremental values associated with this proposed critical habitat designation (i.e., the ecosystem and species protection measures considered in these studies are too dissimilar from the habitat protection benefits that may be afforded by this designation). Again, because the designation of critical habitat for the eight mussels is unlikely to preserve new areas or protect wildlife above existing baseline protections, such benefits are unlikely.
215. Similarly, economists have conducted research on the economic value of ancillary benefits, such as the preservation of open space, which may positively affect the value of neighboring parcels, or maintenance of natural hydrologic functions of an ecosystem, which result in improved downstream water quality. Ancillary benefits are unlikely given that no changes in behavior to protect such resources are anticipated to result from the designation.

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APPENDIX A | SMALL BUSINESS AND ENERGY IMPACTS ANALYSES

216. This appendix considers the extent to which incremental impacts from critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.
217. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the Final Rule.

A.1 SBREFA ANALYSIS

218. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).²⁵³ No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for eight mussel critical habitat to affect small entities.
219. To ensure broad consideration of impacts on small entities, the Service has prepared this small business analysis without first making the threshold determination in the Proposed Rule regarding whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities. This small business analysis will therefore inform the Service's threshold determination.

²⁵³ 5 U.S.C. § 601 et seq.

A.1.1 OVERVIEW OF RFA APPLICABILITY

220. This analysis is intended to improve the Service's understanding of the potential effects of the Proposed Rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. The Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat." This section grants the Secretary [of the Interior] discretion to exclude any area from critical habitat if (s)he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat." However, the Secretary may not exclude an area if it "will result in the extinction of the species."
221. Three types of small entities are defined in the RFA:
- **Small Business** - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The SBA has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to NAICS industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
 - **Small Governmental Jurisdiction** - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
 - **Small Organization** - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.
222. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers -- transmitting utilities such as electric cooperatives -- included numerous small entities. In this case, the court agreed that FERC simply authorized large electric

generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.²⁵⁴

223. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.²⁵⁵ The basis of EPA's RFA/SBREFFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of State plans that incorporated the standards. The court found that, while EPA imposed regulation on States, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.
224. The SBA in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.²⁵⁶ "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body."²⁵⁷
225. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the Proposed Rule or by a delegation of impact from the directly regulated entity.
226. This screening analysis focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Chapter 4 of this economic analysis. As discussed in greater detail in Chapters 2, 3, and 4, incremental impacts of the designation of critical habitat are likely to be limited to administrative costs of section 7 consultations. Small entities may participate in section 7 consultation as a third party (the primary consulting parties being the Service and the Federal action agency). It is therefore possible that the small entities may spend additional time considering critical habitat during section 7 consultation for the eight mussel species. Additional incremental costs of consultation

²⁵⁴ 773 F. 2d 327 (D.C. Cir. 1985).

²⁵⁵ 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

²⁵⁶ Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, pg. 20.

²⁵⁷ *Ibid.*, pg. 21.

that would be borne by the Federal action agency and the Service are not relevant to this screening analysis as these entities (Federal agencies) are not small.

A.1.2 ANALYSIS OF IMPACTS TO SMALL ENTITIES

227. As described in Chapters 3 and 4, activities that may be affected by the designation include: impoundments, dams, and diversions; dredging, channelization, and in-stream mining; transportation and utilities; residential and commercial development; timber management, agriculture, and grazing; and oil wells and drilling.
228. We do not expect critical habitat designation to result in impacts to small entities for the following activities:
- *Timber Management, Agriculture, and Grazing*: Section 4.2.6 of this analysis discusses the potential for the eight mussels' critical habitat to affect these activities. Impacts to these activities are expected to be limited to administrative costs associated with the annual re-initiation of NRCS statewide programmatic consultations in both States. As the programmatic consultation is only expected to involve administrative effort on the part of NRCS and the Service, no impacts on small entities are expected.
 - *Oil Wells and Drilling*: Section 4.2.7 of this analysis discusses the potential for eight mussels critical habitat to affect oil wells and drilling activities. We do not forecast any incremental impacts to these activities; therefore, we do not expect any impacts to small entities related to oil wells and drilling.
229. Chapters 3 and 4 discuss forecast consultations between the EPA and the Service related to State water quality standards in Alabama and Florida, as well as consultations between the DOD and Service related to annual review of the NAS' INRMP. Because these consultations do not involve third-parties, no impacts to small entities are expected related to these consultations.
230. Estimated incremental costs that may be borne by small entities consist of administrative impacts of section 7 consultation related to impoundments, dams and diversions; dredging, channelization, and in-stream mining; transportation and utilities (in-stream transportation structures and utilities only); and commercial and residential development. These potential impacts are described in greater detail below.
- **Impoundments, Dams, and Diversions.** Of the three forecast projects described in Section 4.2.5, only one is being undertaken by an entity that is considered small. Conecuh County, Alabama, represents a population of only 13,228.²⁵⁸ NFWFMD and the Choctawhatchee, Pea & Yellow Rivers Watershed Management Authority, who are also likely to experience impacts, both serve populations in excess of 50,000. The cost to Conecuh County to participate in the consultation is approximately \$875.²⁵⁹ This cost represents less than 0.09 percent of annual revenues.²⁶⁰

²⁵⁸ US Census Quickfacts, accessed at <http://quickfacts.census.gov/qfd/states/01/01035.html> on January 9, 2012.

²⁵⁹ When estimating costs in Chapter 4, we assume this consultation is likely to occur sometime between 2012 and 2014 and assign one-third of the administrative costs to each of these three years. For the purposes of this analysis, we assume that the total costs are borne in a single year, 2012.

- Dredging, Channelization, and In-Stream Mining.** This analysis forecasts consultations on dredging projects, as discussed in Section 4.2.3. Between 2000 and 2010, two dredging projects that may have involved small entities were permitted by the Corps within counties containing critical habitat. We forecast potential future incremental administrative costs to small entities based on this pattern, and forecasts that four such efforts will occur in the next 20 years. This analysis makes the conservative assumption that the project proponents will be small local government entities, specifically, small counties serving populations of less than 50,000. The incremental cost to a third party of participating in each consultation is \$875.²⁶¹ Assuming that all dredging impacts are borne by four small counties, this amounts to less than one affected entity per year. Assuming each consultation is undertaken by a separate entity, the per entity impact represents less than 0.09 percent of annual revenues.²⁶²
- Transportation and Utilities.** Section 4.2.4 of this analysis discusses the potential for eight muskellunge critical habitat to affect transportation and utility activities. Administrative costs of consultations on road and bridge construction and maintenance are expected to be borne by the Service and State transportation departments. Therefore, no incremental impacts to small entities are anticipated related to these consultations. However, administrative costs related to consultations on in-stream transportation and utilities may involve counties as third-party project proponents. Some of these counties may be considered small.

Small entities that may bear administrative costs associated with in-stream transportation and utilities include Conecuh, Covington, Escambia, Crenshaw, Pike, and Geneva Counties, Alabama, and Washington County, Florida, all of which serve populations of less than 50,000. The cost to each county to participate in a consultation is approximately \$875. This cost represents less than 0.09 percent of annual revenues.^{263,264}

²⁶⁰ Throughout this Appendix, we assume all the affected county entities have tax revenues of at least \$1 million annually. Crenshaw County, one of the smaller counties in the study area with a population of only 13,906 in 2010, reported annual tax revenue of more than \$3.2 million. Population statistics: US Census *Quickfacts*, accessed at <http://quickfacts.census.gov/qfd/states/01/01035.html> on January 9, 2012. Budget statistics: Personal communication with Crenshaw County Revenue Commissioner on January 9, 2011.

²⁶¹ We assume all the affected county entities have tax revenues of at least \$1 million annually. Population statistics: US Census *Quickfacts*, accessed at <http://quickfacts.census.gov/qfd/states/01/01035.html> on January 9, 2012.

²⁶² If we assume that a single small entity undertakes multiple consultations in a single year, the impacts are still likely to be less than 0.1 percent of annual revenues. For example, if the costs to dredging, channelization, and in-stream mining of \$875 are borne by a single entity in a given year, these costs represent less than 0.01 percent of annual revenues.

²⁶³ We assume all the affected county entities have tax revenues of at least \$1 million annually. Population statistics: US Census *Quickfacts*, accessed at <http://quickfacts.census.gov/qfd/states/01/01035.html> on January 9, 2012.

²⁶⁴ In Chapter 4, we estimate that approximately 75 consultations will occur across all counties (small and large) over the 20-year time period of the analysis. For the purposes of this analysis, we assume affected counties will participate in approximately one consultation per year. However, if we assume that a single county participates in multiple consultations in a single year (e.g., in 2012, we estimate 5.7 consultations are likely to occur), the administrative costs of such activity are still likely to be less than 1 percent of annual tax revenues (e.g., 6 consultations x \$875/\$1,000,000 = 0.5 percent of annual revenues).

- **Residential and Commercial Development.** Potential total third party incremental impacts related to development activities are estimated to be \$875 per entity.²⁶⁵ We assume that all development-related impacts are borne by 24 small entities (equivalent to the total number of forecast section 7 consultations). Development and construction firms are often the proponent of the development subject to section 7 consultation. In counties containing proposed critical habitat, more than 99.5 percent of development firms and construction companies are small, with weighted average annual revenues of \$4 million.²⁶⁶ Assuming each consultation is undertaken by a separate entity, annualized impacts are estimated to be less than 0.01 percent of annual revenues.²⁶⁷

231. Exhibit A-1 presents the results of this analysis. It provides the relevant small entity thresholds by NAICS code, the total number of entities and small entities, and the estimated incremental impacts as a percentage of annual revenues.

²⁶⁵ Because we do not know when, over the next 20 years, the development consultations will occur, we distribute the consultations evenly throughout the time period.

²⁶⁶ Annual revenues are estimated to be \$4 million using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011*, 2010. Average annual revenues per entity are estimated to be \$4 million. This figure represents a weighted average across four NAICS codes (237210, 236115, 236116, 236117) and weighted based on the number of entities of varying size classes below the small entity threshold (e.g., \$0 to \$1 million, \$1 million to \$3 million, \$3 to \$5 million, etc.).

²⁶⁷ If we assume that a single small entity undertakes multiple consultations in a single year, the impacts are still likely to be less than 0.1 percent of annual revenues. For example, if the total costs to development of \$962 on an annualized basis are borne by a single entity in a given year, these costs represent 0.02 percent of annual revenues.

EXHIBIT A-1. SUMMARY OF UPPER-BOUND POTENTIAL IMPACTS ON SMALL ENTITIES

ACTIVITY	INDUSTRY (NAICS CODES)	SMALL ENTITY SIZE STANDARD (MILLIONS OF DOLLARS)	TOTAL NUMBER OF ENTITIES	NUMBER OF SMALL ENTITIES	NUMBER OF AFFECTED SMALL ENTITIES ¹ (PERCENT OF TOTAL SMALL ENTITIES)	ANNUAL INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES	IMPACTS AS % OF ANNUAL REVENUES ²
Impoundments, Dams, and Diversions	Conecuh County, AL	Small governmental jurisdictions representing populations less than 50,000	-	-	1 entity over 20 years (less than one entity per year)	\$875 per entity	0.09%
Transportation and Utilities (In-Stream Transportation Structures And Utilities Only)	Conecuh, Covington, Escambia, Crenshaw, Pike, and Geneva Counties, AL; Washington County, FL		-	-	7 entities over 20 years (less than one entity per year)	\$875 per entity ³	0.09%
Dredging, Channelization, and In-Stream Mining	Unidentified government proponents (whether Federal, State, or local is unknown)		-	-	4 entities over a 20 year period (less than one entity per year)	\$875 per entity ⁴	Less than 0.01%
Development	New Single-Family Housing Construction (236115)	\$33.50	4,220	4,204	24 entities over 20 years (approximately 1.2 entities per year)	\$875 per entity ⁵	Less than 0.01%
	New Multifamily Housing Construction (236116)		303	302			
	New Housing Operative Builders (236117)	75	71				
	Land Subdivision (237210)	\$7.00	573	567			

Notes:

1. To estimate the number of affected small entities, this analysis assumes one small entity per forecast section 7 consultation.
2. Annual revenues related to development activities are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011*, 2010. For each NAICS code, RMA provides the net sales and the number of entities falling within several sales categories: \$0 to \$1 million, \$1 to 3 million, \$3 to \$5 million, \$5 to 10 million, or \$10 to \$25 million. Based on the number of entities and total net sales falling within each sales category, we developed an estimate of the weighted average net sales (revenues) per small entity: for counties, annual tax revenues are assumed to be \$1 million; for development firms, revenues are estimated at \$4 million annually. For counties, we conservatively assume annual tax revenues are \$1 million; actual revenues are likely to be higher.
3. We are uncertain in what year consultations on in-stream transportation structures and utilities will occur over the next 20 years. At the high end, five to six consultations may occur in 2012, which would result in impacts of up to \$5,250, or 0.5 percent of annual tax revenues.
4. We are uncertain in what year consultations on dredging, channelization, and in-stream mining will occur over the next 20 years. At the high end, four consultations may occur in 2012, which would result in impacts of up to \$3,500, or 0.4 percent of annual tax revenues.
5. It is unlikely that all 24 consultations will be undertaken by the same small entity in a single year. However, if this were the case, impacts would likely represent less than one percent of annual revenues ($24 \times \$875 / \$4 \text{ million} = 0.5 \text{ percent}$).

Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on January 5, 2011.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

232. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”⁵²⁴
233. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:
- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
 - Reductions in fuel production in excess of 4,000 barrels per day;
 - Reductions in coal production in excess of 5 million tons per year;
 - Reductions in natural gas production in excess of 25 million Mcf (1,000 cubic feet) per year;
 - Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
 - Increases in energy use required by the regulatory action that exceed the thresholds above;
 - Increases in the cost of energy production in excess of one percent;
 - Increases in the cost of energy distribution in excess of one percent; or
 - Other similarly adverse outcomes.⁵²⁵
234. As discussed in Section 4.2.7 of this report, we do not anticipate impacts to oil wells and drilling activities taking place in the study area. Thus, none of these outcomes are anticipated.

⁵²⁴ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

⁵²⁵ *Ibid.*

APPENDIX B | SENSITIVITY OF RESULTS TO DISCOUNT RATE

235. This appendix summarizes the costs of eight mussel conservation units quantified in Chapter 4 of this report. It presents impacts assuming an alternative real discount rate of three percent (the main text of the report assumes a real discount rate of seven percent).²⁷⁰ Exhibit B-1 through B-8 summarize potential undiscounted incremental impacts of the designation overall and by activity, including: Impoundments, Dams, and Diversions; Dredging, Channelization, and In-Stream Mining; Transportation and Utilities; Development; and Timber Management, Agriculture, and Grazing (as described in Chapter 4).

EXHIBIT B-1. SUMMARY OF TOTAL INCREMENTAL IMPACTS BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$181,000	\$11,800
AP2	\$125,000	\$8,180
AP2/GCM1	\$40,400	\$2,630
GCM1	\$535,000	\$34,900
GCM2	\$10,000	\$654
GCM3	\$88,700	\$5,790
GCM4	\$52,300	\$3,410
GCM5	\$264,000	\$17,200
GCM6	\$897,000	\$58,500
GCM7	\$60,700	\$3,960
Total	\$2,250,000	\$147,000

²⁷⁰ A more detailed discussion of how to calculate present and annualized values, as well as the relevant discount rates, is provided in Chapter 2 of this report.

EXHIBIT B-2. SUMMARY OF INCREMENTAL IMPACTS TO WATER QUALITY MANAGEMENT BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$8,260	\$539
AP2	\$6,290	\$410
AP2/GCM1	\$7,590	\$495
GCM1	\$98,000	\$6,400
GCM2	\$1,850	\$121
GCM3	\$13,300	\$868
GCM4	\$12,300	\$800
GCM5	\$77,100	\$5,030
GCM6	\$199,000	\$13,000
GCM7	\$20,900	\$1,370
Total	\$444,000	\$29,000

EXHIBIT B-3. SUMMARY OF INCREMENTAL IMPACTS TO DOD LAND MANAGEMENT BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$0	\$0
AP2	\$37,200	\$2,430
AP2/GCM1	\$0	\$0
GCM1	\$37,200	\$2,430
GCM2	\$0	\$0
GCM3	\$0	\$0
GCM4	\$0	\$0
GCM5	\$0	\$0
GCM6	\$0	\$0
GCM7	\$0	\$0
Total	\$74,400	\$4,850

EXHIBIT B-4. SUMMARY OF INCREMENTAL IMPACTS TO IMPOUNDMENTS, DAMS, AND DIVERSIONS BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$0	\$0
AP2	\$4,710	\$308
AP2/GCM1	\$0	\$0
GCM1	\$0	\$0
GCM2	\$0	\$0
GCM3	\$0	\$0
GCM4	\$0	\$0
GCM5	\$4,710	\$308
GCM6	\$4,710	\$308
GCM7	\$0	\$0
Total	\$14,100	\$923

EXHIBIT B-5. SUMMARY OF INCREMENTAL IMPACTS TO DREDGING, CHANNELIZATION, AND IN-STREAM MINING BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$0	\$0
AP2	\$0	\$0
AP2/GCM1	\$0	\$0
GCM1	\$7,440	\$485
GCM2	\$0	\$0
GCM3	\$0	\$0
GCM4	\$0	\$0
GCM5	\$0	\$0
GCM6	\$7,440	\$485
GCM7	\$0	\$0
Total	\$14,900	\$971

EXHIBIT B-6. SUMMARY OF INCREMENTAL IMPACTS TO TRANSPORTATION AND UTILITIES BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$162,000	\$10,600
AP2	\$74,700	\$4,870
AP2/GCM1	\$14,900	\$971
GCM1	\$368,000	\$24,000
GCM2	\$7,440	\$485
GCM3	\$70,100	\$4,580
GCM4	\$35,200	\$2,300
GCM5	\$148,000	\$9,670
GCM6	\$589,000	\$38,400
GCM7	\$24,000	\$1,570
Total	\$1,490,000	\$97,500

EXHIBIT B-7. SUMMARY OF INCREMENTAL IMPACTS TO DEVELOPMENT BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$7,440	\$485
AP2	\$0	\$0
AP2/GCM1	\$14,900	\$971
GCM1	\$0	\$0
GCM2	\$0	\$0
GCM3	\$0	\$0
GCM4	\$0	\$0
GCM5	\$16,900	\$1,100
GCM6	\$48,100	\$3,140
GCM7	\$7,440	\$485
Total	\$94,700	\$6,180

EXHIBIT B-8. SUMMARY OF INCREMENTAL IMPACTS TO TIMBER MANAGEMENT, AGRICULTURE, AND GRAZING ACTIVITIES BY UNIT (2011\$)

UNIT	PRESENT VALUE	ANNUALIZED COSTS
AP1	\$3,270	\$214
AP2	\$2,490	\$163
AP2/GCM1	\$3,010	\$196
GCM1	\$24,700	\$1,610
GCM2	\$734	\$48
GCM3	\$5,270	\$344
GCM4	\$4,860	\$317
GCM5	\$16,700	\$1,090
GCM6	\$48,600	\$3,170
GCM7	\$8,300	\$542
Total	\$118,000	\$7,690

APPENDIX C | UNDISCOUNTED IMPACTS BY ECONOMIC ACTIVITY

236. This appendix summarizes undiscounted impacts by year for each economic activity. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: “include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars.”²⁷¹ Exhibit C-1 summarizes potential undiscounted incremental impacts of the designation overall and by activity, including: Impoundments, Dams, and Diversions; Dredging, Channelization, and In-stream Mining; Transportation and Utilities; Development; and Timber management, Agriculture, and Grazing; and Oil Wells and Drilling (as described in Chapter 4).

²⁷¹ Office of Management and Budget, Circular A-4, September 17, 2003, p. 18. The reference to “constant” dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index.

EXHIBIT C-1. SUMMARY OF INCREMENTAL IMPACTS BY YEAR BY ACTIVITY (2011\$)

YEAR	IMPOUNDMENTS, DAMS, AND DIVERSIONS	DREDGING, CHANNELIZATION, AND IN-STREAM MINING	TRANSPORTATION AND UTILITIES	DEVELOPMENT	TIMBER MANAGEMENT, AGRICULTURE, AND GRAZING	OIL WELLS AND DRILLING	WATER QUALITY MANAGEMENT	DOD LAND MANAGEMENT	TOTAL
2012	\$5,000	\$1,000	\$176,000	\$14,500	\$8,080	\$0	\$36,300	\$5,000	\$245,000
2013	\$5,000	\$1,000	\$166,000	\$9,500	\$7,900	\$0	\$26,300	\$5,000	\$220,000
2014	\$5,000	\$1,000	\$166,000	\$14,500	\$7,900	\$0	\$26,300	\$5,000	\$225,000
2015	\$0	\$1,000	\$166,000	\$4,500	\$7,900	\$0	\$36,300	\$5,000	\$220,000
2016	\$0	\$1,000	\$166,000	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$210,000
2017	\$0	\$1,000	\$70,500	\$9,500	\$7,900	\$0	\$26,300	\$5,000	\$120,000
2018	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$36,300	\$5,000	\$125,000
2019	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2020	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2021	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$36,300	\$5,000	\$125,000
2022	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2023	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2024	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$36,300	\$5,000	\$125,000
2025	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2026	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2027	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$36,300	\$5,000	\$125,000
2028	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2029	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
2030	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$36,300	\$5,000	\$125,000
2031	\$0	\$1,000	\$70,500	\$4,500	\$7,900	\$0	\$26,300	\$5,000	\$115,000
Total	\$15,000	\$20,000	\$1,900,000	\$120,000	\$158,000	\$0	\$596,000	\$100,000	\$2,900,000

APPENDIX D | INFORMATION FROM THE U.S. FISH AND WILDLIFE SERVICE REGARDING POTENTIAL CHANGES IN CONSERVATION FOR THE EIGHT MUSSELS FOLLOWING DESIGNATION OF CRITICAL HABITAT

Incremental Effects Memorandum



United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/ES/

JUL 15 2011

Memorandum

To: Senior Associate, Industrial Economics, Inc., Cambridge, Massachusetts
(Attn: Maura Flight)

From: *[Signature]*
Acting for Chief, Division of Endangered Species, Southeast Region, U.S. Fish and
Wildlife Service, Atlanta, Georgia

Subject: Incremental Effects Memorandum for the Economic Analysis for
Proposed Rule to Designate Critical Habitat for Eight Southeastern
Mussels

The Fish and Wildlife Service is preparing a proposed rule to list the Alabama pearlshell, round ebonyshell, southern sandshell, southern kidneyshell, and Choctaw bean as endangered species, and the tapered pigtoe, narrow pigtoe, and fuzzy pigtoe as threatened species. In addition, we are concurrently proposing 2,405 kilometers (km) (1,494 miles (mi)) of streams and rivers within Alabama and Florida as critical habitat. We are providing the information below to assist you with the forthcoming economic analysis for this critical habitat designation.

Designation Objectives: The proposed critical habitat units for the Alabama pearlshell, round ebonyshell, southern sandshell, southern kidneyshell, Choctaw bean, tapered pigtoe, narrow pigtoe, and fuzzy pigtoe are based on known occurrence records for these species, as well as with unoccupied habitat that will allow for eventual translocation or reintroduction of the species to these sites. The geographic distribution of the proposed critical habitat units was based on both the current and the historic (pre-1995) distribution of each species. The 9 proposed critical habitat units were chosen based on physical and biological factors including: (1) Protection of existing occupied habitat; (2) Conservation of genetic diversity; (3) Connectivity of habitat; (4) Habitat sufficient to support population viability; and (5) Existing threats.

Designation Summary: We are proposing to designate 9 critical habitat units including the entire habitat that was known to be occupied at the time of listing and additional unoccupied habitat that is essential to the conservation of the species. The proposed critical habitat designation (summarized in Table 1 below) includes portions of the Escambia, Yellow, and Choctawhatchee River basins in Florida and Alabama, and small portions of the Mobile River basin in Alabama. Critical habitat is proposed for the

stream channel within the ordinary high water line only. Florida and Alabama own navigable stream bottoms within the ordinary high water line. We believe that most, if not all, of the lands beneath most non-navigable waters included in this proposed rule are in private ownership. Adjacent lands are under Federal, State (both Alabama and Florida), County, and private ownership and subject to different levels of recreational use, transportation projects, commercial timber harvest, agriculture, utility rights of way, and urban development projects.

TABLE 1. Location, approximate stream length, and ownership of riparian lands adjacent to proposed critical habitat units.

Unit	Location	Total Length km (mi)	Private km (mi)*	Private/ Protected km (mi)*	Protected km (mi)*
AP1	Big Flat Creek, AL	92 (57)	92 (57)	0	0
AP2	Burnt Corn Creek, Murder Creek, and Sepulga River, AL	156 (97)	156 (97)	0	0
GCM1	Lower Escambia River, AL, FL	558 (347)	482 (299)	18 (11)	59 (36)
GCM2	Point A Lake and Gantt Lake Reservoirs, AL	21 (13)	21 (13)	0	0
GCM3	Patsalliga Creek, AL	149 (92)	149 (92)	0	0
GCM4	Upper Escambia River, AL	137 (85)	130 (81)	7 (4)	0
GCM5	Yellow River, AL, FL	253 (157)	104 (64)	68 (42)	81 (50)
GCM6	Choctawhatchee and Lower Pea River, AL, FL	892 (554)	718 (446)	61 (38)	119 (74)
GCM7	Upper Pea River, AL	234 (145)	228 (142)	0	5 (3)
Overlap between units AP2 and GCM1		- 85 (53)	---	---	---
Total		2,405 (1,494)	1,993 (1,239)	153 (95)	264 (164)

Note: Distances may not sum due to rounding.

*Ownership is categorized by private ownership on both banks of the river (Private); private on one bank and county, state or federal on the other (Private/Protected); and county, state, or federal on both banks (Protected).

Jeopardy Analysis: The jeopardy analysis is focused not only on population relationships, but also on the habitat conditions that support them. The jeopardy analysis considers the range-wide status of the eight mussels, the factors responsible for that condition, and the species' survival and recovery needs. It also characterizes the condition of the eight mussels in the area affected by the proposed Federal action (i.e., the action area), and the survival and recovery role of the action area in the conservation of the eight mussels range-wide. That context is then used to determine the significance of adverse and beneficial effects of the proposed Federal action, and any cumulative effects for purposes of making the jeopardy determination. The jeopardy analysis also considers any conservation measures that may be proposed by a Federal action agency to minimize or compensate for adverse project effects to the eight mussels or to promote their recovery.

Adverse Modification Analysis: The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat will continue to, or have the capability to serve its intended conservation role for the species. This can be met by retaining or regaining the proper function of those physical and biological features of the habitat necessary to support the life cycle needs of the eight mussels. Activities that may destroy or adversely modify critical habitat are those that would alter those physical and biological features to an extent that appreciably reduces the intended conservation function of the designated critical habitat unit.

Activities of Potential Concern: Activities that may result in adverse effects to critical habitat could include those that: (1) Alter the hydrology or water quality of their habitats (e.g., discharge of fill material; release or dumping of toxic chemicals, silt, or biological pollutants; diversion, alteration, or withdrawal of surface or ground water flow; construction and operation of impoundments; and installation of transportation crossings); (2) Activities that would destabilize the stream channel (e.g., dredging and mining). These types of activities would require section 7 consultation only in cases where there is Federal involvement (e.g., a project is proposed, funded, or authorized by a Federal agency).

Baseline Impacts: When consulting under section 7 in designated critical habitat, independent analyses are conducted for jeopardy to the species and adverse modification of critical habitat. We determine destruction or adverse modification of designated critical habitat on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain the current ability for the essential features to be functionally established) to serve its intended conservation role for the species. Jeopardy occurs when an action is reasonably expected, directly or indirectly, to diminish a species' numbers, reproduction, or distribution so that the likelihood of survival and recovery in the wild is appreciably reduced.

The Alabama pearlshell no longer occurs in three streams where it was historically found in the Escambia River drainage; and it may be extirpated from two stream systems in the Mobile River basin, essentially extirpating it from the basin. The round ebonyshell has a very restricted distribution, and its current range is confined to approximately 120 km (75 mi) of the Escambia River main channel. The southern sandshell's range is fragmented, and it may be extirpated from central portions of the Choctawhatchee River main channel and some of its tributaries. The southern kidneyshell has undergone drastic range reductions; and it appears to be extirpated from the entire Escambia basin, and fragmented in the Choctawhatchee basin. The Choctaw bean persists in most of its historical range; however, it has disappeared from many portions of its range, particularly in the Escambia and Yellow River drainages. The tapered pigtoe is endemic to the Choctawhatchee River drainage where it appears to be absent from portions of its historical range and is found only in isolated locations, mainly in the Choctawhatchee River main channel in Florida and in the headwaters in Alabama. The narrow pigtoe still occurs in much of its historic range, but may be extirpated from localized areas in the Escambia and Yellow River basins. The fuzzy pigtoe has disappeared from a large

section of the Escambia River main channel and several tributaries, and from most of the Yellow River drainage. We attribute the limited and declining ranges of these eight species mainly to habitat modification and destruction.

There is a close relationship between the health of these 8 species and the health of their habitat. Alterations of habitat that diminish the value (e.g., actions which alter hydrology, water quality, or suitability of substrate) and the amount of habitat available for the species would be likely to affect their population size and ability to recruit, as well as cause further range declines, and would, therefore, appreciably reduce their likelihood of survival in the wild and constitute jeopardy. In most cases, the results of consultation under the adverse modification and jeopardy standards are likely to be similar because (1) The primary constituent elements that define critical habitat are also essential for the survival of the eight mussels, (2) The eight mussels are limited or severely limited in their respective ranges, and (3) Numbers of individuals in the surviving populations are small or very small. Thus, project modifications that may be needed to minimize impacts to the species would coincidentally minimize impacts to critical habitat. Accordingly, in occupied critical habitat, it is unlikely that an analysis would identify a difference between measures needed to avoid the destruction or adverse modification of critical habitat from measures needed to avoid jeopardizing the species. Absent reasonably foreseeable economic impacts that are distinctly attributable to the critical habitat portion of the analysis (such as those possible from designation of unoccupied habitat), economic impacts from conservation efforts that avoid adverse modification of critical habitat coincidental to avoiding jeopardizing the species would be coextensive with the impacts of the listing and within the regulatory baseline.

It is important to point out that, although unoccupied habitat is designated for two of the eight species, in both cases these areas are occupied by other species addressed in this proposed rule. The southern kidneyshell is not currently known to occupy portions of proposed critical habitat (units GCM 1, 3, and 4), however the proposed units are designated for multiple species and are occupied by three or more species with similar PCEs. A portion of the proposed critical habitat is considered unoccupied by the Alabama pearlshell (17 km (11 mi) of AP2), but is included in an overlapping unit (GCM1) which is occupied by five species with similar PCEs. Thus all proposed critical habitat is occupied by one or more of the eight species, though certain species are considered absent from particular portions. Therefore, the impacts attributed to federal actions within the unoccupied portions of proposed critical habitat (AP2, GCM1, 3, and 4) would not be incremental to the impacts on listed species because all of the units are occupied by one or more of the species.

There are several background laws and regulations in place in these proposed critical habitat units that can be considered baseline environmental protections, and therefore should be considered in the economic analysis. All of these critical habitat units, for instance, are subject to the federal Clean Water Act of 1972 as well as State water quality laws and regulations. Portions of the Escambia, Conecuh, Sepulga, Yellow, Shoal, Pea, and Choctawhatchee Rivers are also designated critical habitat for the threatened Gulf

sturgeon (68 FR 13370), and occupied by these sturgeon at various points in their life cycle.

Incremental Impacts: For a new section 7 consultation, the jeopardy analysis and the adverse modification analysis would be analyzed separately. In projects where we determine that an adverse modification finding may be likely, we work with the Federal agency involved to identify reasonable and prudent alternatives that would eliminate or reduce those impacts to a point where adverse modification is no longer likely. The resulting project modifications would appropriately be considered to be an incremental cost of the critical habitat designation. It is difficult estimating the incremental cost that adding an adverse modification analysis to a jeopardy analysis would have. Other "incremental effects memos" for similar actions have estimated an approximate 10 percent increase in administrative costs so that may be applicable in this instance.

We look forward to working with you on the development of the economic analysis. If you have any questions or need additional information, please contact Rob Tawes of my staff at 404/679-7142, Sandy Pursifull of the Panama City Field Office at 850-769-0552, ext. 240, or Jeff Powell of the Alabama Field Office at 251/441-5858.

Follow-on Communication

To IEC from U.S. Fish and Wildlife Service, Panama City Field Office

Sent: Wednesday, October 19, 2011 10:28 AM

Subject: RE: Conference Call for 8 Mussel Economic Analysis: Thursday, October 20

Here's what I have so far as replies to your questions.

(See attached file: *Reply to IEC issues.docx*)

- IEC's Question: Are the protections associated with the presence of any one of the 8 mussels species (i.e., the listing provisions) sufficiently protective of critical habitat for the other mussel species? For example, does the presence of the four mussel species that occupy Unit GCM3 ensure sufficient protection to avoid adverse modification of critical habitat proposed in that unit for the southern kidneyshell (unoccupied)? I assume from your email below that you determined the answer to this question is yes. Is that correct?
 - **Service's Response: YES.**
- IEC's Question: The proposed rule indicates that 17 km of Murder Creek are not occupied by any of the eight mussels. Is it therefore the case that consultations on activities affecting this portion of the habitat may be due specifically to critical habitat (and not jeopardy)? If this is the case, we may expect to see incremental impacts of conservation beyond administrative costs in this unit.
 - **Service's Response: 17 km of Murder Creek is not occupied by the Alabama pearlshell; however, it is occupied by the species present in GCM1: round ebonyshell, southern sandshell, Choctaw bean, narrow pigtoe, and fuzzy pigtoe. Therefore it is not truly unoccupied, just unoccupied by the pearlshell.**
- IEC's Question: At what distance from the critical habitat (i.e., the rivers and streams themselves) might activities result in potential jeopardy/adverse modification. In other words, is there a rule of thumb regarding how far from the streams the activities "may affect" the species or critical habitat? On the call, the Service suggested it would provide guidance on this. For riverine species, we have made various assumptions regarding where to look at adjacent land use activities in the past. These assumptions are typically either a fixed distance from the stream (e.g., within ½ mile of the stream) or based on watersheds. For the seven mussels analysis, we looked at activities occurring within the HUC6 watersheds that encompassed proposed critical habitat, assuming these activities may undertake consultation considering effects on the species. Does something like that make sense here?
 - **Service's Response: Yes, using the HUC6 is appropriate and is the only way to capture all activities that may result in potential jeopardy/adverse modification. A fixed distance would not work as that would depend on the type of activity.**