



ECONOMIC ANALYSIS OF
CRITICAL HABITAT
DESIGNATION FOR THE
WINTERING PIPING PLOVER

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prepared for:

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

CHAPTER 1 FRAMEWORK FOR ANALYSIS AND BACKGROUND INFORMATION *1-1*

- 1.1 Background *1-1*
- 1.2 Regulatory Alternatives *1-2*
- 1.3 Approach to Estimating Economic Impacts *1-2*
- 1.4 Defining the Baseline *1-5*
- 1.5 Benefits *1-6*
- 1.6 Analytic Time Frame *1-6*
- 1.7 Information Sources *1-7*
- 1.8 Structure of the Report *1-7*

CHAPTER 2 ECONOMIC IMPACTS ON ORV USE *2-1*

- 2.1 Summary of Economic Impacts *2-1*
- 2.2 Background *2-3*
- 2.3 Future Economic Impacts on ORV Use in Cape Hatteras National Seashore *2-8*

CHAPTER 3 ADMINISTRATIVE COSTS *3-1*

- 3.1 Estimated Costs of Consultations and Technical Assistance *3-1*
- 3.2 Summary of Past Administrative Costs *3-2*
- 3.3 Summary of Future Administrative Costs *3-2*
- 3.4 Caveats *3-2*

REFERENCES *R-1*

APPENDIX A SMALL BUSINESS AND ENERGY IMPACTS ANALYSES *A-1*

APPENDIX B MAP OF PROPOSED CRITICAL HABITAT *B-1*

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the wintering population of the federally listed *Charadrius melodus* (piping plover). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service's (Service).
2. On June 12, 2006, the U.S. Fish and Wildlife Service (Service) published a proposed amendment to the critical habitat designation for the wintering piping plover. The Service has proposed to designate critical habitat for this species on approximately 1,827 acres in North Carolina. The proposed critical habitat is divided into four units. All units are federally owned and are located within the Cape Hatteras National Seashore.
3. The proposed amendment to critical habitat re-designating the four units was prompted by *Cape Hatteras Access Preservation Alliance v. US Department of the Interior*. In this case, the court found that the previous economic analysis failed to consider the effect of possible closures to beaches on off-road vehicle (ORV) use and potential administrative costs to the National Park Service (NPS) resulting from section 7 consultation. This analysis focuses exclusively on these two sources of economic impacts, and the incremental impacts that could result from additional beach closures undertaken to protect plover critical habitat.¹
4. The key findings highlighted below and Exhibits ES-1 and ES-3 summarize the quantitative results of this analysis. As noted in the key findings, there is significant uncertainty regarding the potential impacts of this designation on ORV use, since decisions regarding closures or other management actions have not been made. This analysis presents impacts on ORV use both in terms of social welfare (i.e. consumer surplus) values and trip expenditures. Potential undiscounted impacts are estimated to include \$0 to \$12.2 million in lost consumer surplus and \$0 to \$21.1 million in lost trip expenditures over the next 20 years, with an additional \$32,000 to \$79,000 in administrative costs. This large range in forecast impacts is the result of uncertainty in the impact of the designation on NPS management decisions and in the response of ORV users to changes in management.

¹ At this time, NPS is not undertaking any other activities on which it expects to be required to consult in the future. Other than recreational activities, NPS also does not know of any projects or activities such as US Army Corps of Engineers dredging that could potentially be affected by critical habitat. Personal communication, Thayer Broili, National Park Service, Cape Hatteras National Seashore, February 1, 2007.

KEY FINDINGS

Total Future Impacts: Undiscounted, high-end forecast impacts, almost entirely made-up of potential economic impacts associated with lost ORV opportunities, are estimated to include about \$8.1 to \$12.2 million in lost consumer surplus and \$14.1 to \$21.1 million in lost trip expenditures over 20 years. In the low-end cost scenario, there are no required project modifications associated with the designation, only administrative costs (about \$32,000 in undiscounted costs over 20 years). Lost consumer surplus and lost trip expenditures are distinct measures of economic impacts, and thus are not additive. It is important to note that NPS currently anticipates ORV access to the beach will not be affected by the designation of critical habitat.

These results are sensitive to the assumed discount rate. Discounted, high-end forecast impacts are estimated to include about \$4.1 to \$6.2 million in lost consumer surplus and \$7.1 to \$10.6 million in lost trip expenditures, using a real rate of seven percent over the 20 year analysis. Using a real rate of three percent, high-end discounted forecast impacts include about \$5.9 to \$8.9 million in lost consumer surplus and \$10.2 to \$15.4 million in lost trip expenditures over this same time period.

Affected Activities:

- **ORV Use:** This analysis considers the potential economic impacts on ORV use in Cape Hatteras National Seashore that could result from the designation of critical habitat. Because decisions have not been made regarding closures and other management actions, there is significant uncertainty regarding potential impact of the designation of critical habitat for the wintering piping plover on ORV use. Given these uncertainties, this analysis presents two possible scenarios of future impacts resulting from wintering piping plover conservation activities:

(1) A high-end estimate that describes the incremental impacts that could result from additional beach closures undertaken to protect plover critical habitat. This analysis assumes that incremental impacts would result from NPS closing additional areas of the beach beyond those that would be closed under current NPS management (i.e., in the absence of designation). It assumes that a percentage of all trips to these additional designated areas within Cape Hatteras National Seashore could be lost. Specifically, these lost trips result in two types of economic impacts:

- Based on an estimated range of annual ORV visits, lost consumer surplus is estimated at \$5.9 million to \$8.8 million (2006 dollars, discounted at three percent); and
- Based on an estimated range of annual ORV visits, lost trip expenditures are estimated at \$10.2 to \$15.4 million (2006 dollars, discounted at three percent).

(2) A low-end estimate that assumes no trips will be lost be under a scenario in which: (a) NPS does not implement additional closures in response to the designation, (b) the additional closures that are implemented do not result in decreased level of visitation, or (c) NPS' offsetting management efforts effectively mitigate the impact of additional closures on the quality of ORV activities on the beach (i.e., ORV users do not perceive a significant loss in recreational opportunity). It is important to note that NPS currently anticipates ORV access to the beach will not be affected by the designation of critical habitat. Under this scenario, no economic impacts to ORV users are forecast.

- **Administrative Costs:** Administrative costs for Fish and Wildlife Service consultation with the National Park Service are estimated at \$24,000 to \$59,000 (2006 dollars, discounted at three percent), under either scenario.

Unit with Greatest Impacts: The unit with the greatest projected impacts is NC-2 Cape Hatteras Point, forecast to be \$0 to \$4.9 million (undiscounted) in lost consumer surplus (or about 40 percent of total forecast impacts) and \$0 to \$8.4 million in lost trip expenditures (also about 40 percent of total forecast impacts). About 26 percent of total forecast impacts are associated with Unit NC-4 Hatteras Inlet while Units NC-5 and NC-1 account for approximately 20 and 14 percent of total potential impacts respectively. These rankings are not impacted by the discount rate selected.

5. Discounted future potential impacts are estimated to include \$0 to \$6.2 million in lost consumer surplus and \$0 to \$10.6 million in lost trip expenditures (equal to annualized values of \$0 to \$503,000 in lost consumer surplus and \$0 to \$861,000 in lost trip expenditures) assuming a real rate of discount of seven percent. Administrative costs discounted at seven percent are estimated to be \$17,000 to \$42,000. Using a real rate of three percent, discounted future potential impacts are estimated at \$0 to \$8.9 million in lost consumer surplus and \$0 to \$15.4 million in lost trip expenditures (or annualized values of \$2,000 to \$600,000 in lost consumer surplus and \$0 to \$1.0 million in lost trip expenditures). Administrative costs discounted at three percent are forecast at \$24,000 to \$59,000.²
6. Total visitation to Cape Hatteras National Seashore is expected to generate approximately \$1.1 billion (undiscounted) in trip expenditures and \$639 million in consumer surplus in 2007. At the high-end, lost trip expenditures and lost consumer surplus resulting from the designation of critical habitat are forecast to represent approximately 0.05 to 0.08 percent of the economic value generated through all visitation to the Seashore.
7. This analysis addresses how management actions that may be undertaken to protect plover habitat from the potential impacts of ORV use may affect the value of these areas to ORV users and the regional economy. A primary management tool employed for plover conservation is the implementation of closures of certain portions of beach. However, closing portions of the beach can reduce the opportunities for recreational activity, such as ORV use. Reducing the area of beach available for ORV activity could result in a number of behavioral responses from ORV users, such as visiting substitute beaches, recreating in another location on the same beach (thereby increasing congestion), or choosing not to engage in ORV activities. These types of behavioral responses are described further in Section 2 of this analysis.
8. The large range of potential forecast impacts in this report reflects two major uncertainties: 1) how NPS will manage beach access differently because of the critical habitat designation (e.g., whether any additional closures will be implemented); and 2) whether any management activities, such as closures, will affect visitation levels or quality of visits for ORV users. Given these uncertainties, this analysis presents two scenarios to capture the potential range of impacts:
 - (1) A high-end estimate that describes the potential incremental impacts of additional beach closures. This scenario assumes that additional closures will result in decreased trips to this area (i.e., closures in addition to those in place under current NPS management). To forecast lost trips, the analysis first forecasts trips that would occur over the next 20 years in the absence of the designation, and then forecasts the percentage of those trips that could be lost due to the designation. The percentage of trips that are lost is assumed to be a function of the percentage of visitors to

² Guidance provided by OMB on discounting over time 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, Feb. 3, 2003.)

whom ORV use is important, the timing of visitation, and the proportion of the area that could be closed to ORV activity.

- (2) A low-end estimate that assumes that no trips will be lost either because NPS does not implement additional closures in response to the designation, or because the closures do not result in decreased level of visitation or quality of ORV activities on the beach (i.e., ORV users do not perceive a significant loss in recreational opportunity). It is important to note that NPS currently anticipates ORV access to the beach will not be affected by the designation of critical habitat; under this scenario, there are no lost trips in the future.

For purposes of the executive summary, potential impacts associated with the low-bound estimate are presented as the "low" estimate and costs associated with the high-bound estimate are presented as the "high" estimate. The range presented in the high estimate reflects a range in potential number of ORV visits. The estimated impacts associated with each scenario are detailed in Section 2.

9. Exhibit ES-2 ranks the units proposed for critical habitat designation in order of magnitude of potential impacts using the highest number of potential ORV visits under the high end estimate. For more detailed information regarding present value impacts by activity in each unit, see Exhibit ES-3.

EXHIBIT ES-1 SUMMARY OF POTENTIAL FUTURE IMPACTS (2007-2026)

CATEGORY	UNDISCOUNTED		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
Consumer Surplus and Other Opportunity Costs						
Total Economic Impacts	\$32,000	\$8,141,000 - \$12,242,000	\$24,000	\$5,923,000 - \$8,907,000	\$17,000	\$4,101,000 - \$6,168,000
Annualized Impacts	\$1,600	\$407,000 - \$612,000	\$2,000	\$398,000 - \$600,000	\$3,000	\$388,000 - \$503,000
Trip Expenditures						
Total Economic Impacts	\$0	\$14,076,000 - \$21,114,000	\$0	\$10,240,000 - \$15,360,000	\$0	\$7,089,000 - \$10,634,000
Annualized Impacts	\$0	\$704,000 - \$1,056,000	\$0	\$688,000 - \$1,032,000	\$0	\$669,000 - \$861,000

Note: The range of high-end impacts represents a range in the number of estimated ORV visits.

EXHIBIT ES-2 UNITS RANKED BY LEVEL OF POTENTIAL IMPACT (HIGH END)

UNIT	UNDISCOUNTED				PRESENT VALUE, 3%				PRESENT VALUE, 7%			
	CONSUMER SURPLUS		TRIP EXPENDITURES		CONSUMER SURPLUS		TRIP EXPENDITURES		CONSUMER SURPLUS		TRIP EXPENDITURES	
	IMPACTS	PERCENT OF TOTAL	IMPACTS	PERCENT OF TOTAL	IMPACTS	PERCENT OF TOTAL	IMPACTS	PERCENT OF TOTAL	IMPACTS	PERCENT OF TOTAL	IMPACTS	PERCENT OF TOTAL
NC-2	\$4,861,000	40%	\$8,438,000	40%	\$3,536,000	40%	\$6,139,000	40%	\$2,448,000	40%	\$4,250,000	40%
NC-4	\$3,126,000	26%	\$5,427,000	26%	\$2,274,000	26%	\$3,948,000	26%	\$1,574,000	25%	\$2,733,000	26%
NC-5	\$2,446,000	20%	\$4,246,000	20%	\$1,780,000	20%	\$3,089,000	20%	\$1,232,000	20%	\$2,139,000	20%
NC-1	\$1,730,000	14%	\$3,003,000	14%	\$1,258,000	14%	\$2,185,000	14%	\$871,000	14%	\$1,512,000	14%
Total	\$12,242,000	100%	\$21,114,000	100%	\$8,907,000	100%	\$15,360,000	100%	\$6,168,000	100%	\$10,634,000	100%

Note: Totals may not sum because of administrative costs associated with multiple units.

EXHIBIT ES-3 SUMMARY OF POTENTIAL FUTURE IMPACTS BY UNIT AND ACTIVITY IN PROPOSED CRITICAL HABITAT, 2007-2026

UNIT	UNDISCOUNTED		PRESENT VALUE, 3%		PRESENT VALUE, 7%	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
ORV USE						
Consumer Surplus						
NC-1	\$0	\$1,153,000 - \$1,730,000	\$0	\$839,000 - \$1,258,000	\$0	\$581,000 - \$871,000
NC-2	\$0	\$3,340,000 - \$4,860,000	\$0	\$2,357,000 - \$3,536,000	\$0	\$1,632,000 - \$2,448,000
NC-4	\$0	\$2,084,000 - \$3,126,000	\$0	\$1,516,000 - \$2,274,000	\$0	\$1,050,000 - \$1,574,000
NC-5	\$0	\$1,631,000 - \$2,446,000	\$0	\$1,186,000 - \$1,780,000	\$0	\$821,000 - \$1,232,000
Multiple ^[1]	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$8,109,000 - \$12,163,000	\$0	\$5,899,000 - \$8,848,000	\$0	\$4,084,000 - \$6,126,000
Trip Expenditures						
NC-1	\$0	\$2,002,000 - \$3,003,000	\$0	\$1,456,000 - \$2,185,000	\$0	\$1,008,000 - \$1,512,000
NC-2	\$0	\$5,625,000 - \$8,438,000	\$0	\$4,092,000 - \$6,139,000	\$0	\$2,833,000 - \$4,250,000
NC-4	\$0	\$3,618,000 - \$5,427,000	\$0	\$2,632,000 - \$3,948,000	\$0	\$1,822,000 - \$2,733,000
NC-5	\$0	\$2,831,000 - \$4,246,000	\$0	\$2,060,000 - \$3,089,000	\$0	\$1,426,000 - \$2,139,000
Multiple ^[1]	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$14,076,000 - \$21,114,000	\$0	\$10,240,000 - \$15,360,000	\$0	\$7,089,000 - \$10,634,000
ADMINISTRATIVE COSTS						
Multiple Units ^[1]	\$32,000	\$79,000	\$24,000	\$59,000	\$17,000	\$42,000
Total	\$32,000	\$79,000	\$24,000	\$59,000	\$17,000	\$42,000

Notes:

- [1] Costs in the "Multiple" category are comprised of administrative expenses from consultations that address with multiple units.
- [2] Totals may not sum due to rounding.
- [3] The range of high-end impacts represents a range in the number of estimated ORV visits.

CHAPTER 1 | FRAMEWORK FOR ANALYSIS

10. The purpose of this report is to estimate the economic impact of actions taken to protect the wintering population of the federally listed *Charadrius melodus* (piping plover), within areas proposed for designation in the Service's 12 June 2006 amendment. It attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the cost of conservation-related measures that are likely to be associated with future economic activities that may adversely affect plover habitat within the amendment boundaries. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.³ 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).⁴
11. This chapter provides background information on the species and the proposed amendment. Next, it describes the regulatory alternatives considered by the Service. Then, it describes the approach to estimating incremental impacts and lays out the scope of the analysis. Information sources relied upon are summarized in the next section. The chapter concludes with a description of the organization of the remainder of this report.
- 1.1 BACKGROUND**
12. On December 11, 1985, the Service published the final rule listing the piping plover as endangered in the Great Lakes watershed and threatened elsewhere in its range. Critical habitat was subsequently designated for the wintering population along the southern Atlantic and Gulf coasts.⁵
13. In February 2003, the Cape Hatteras Access Preservation Alliance filed a lawsuit challenging the designation of critical habitat for four North Carolina units, NC-1, NC-2, NC-4, and NC-5. Through the subsequent decision in *Cape Hatteras Preservation Alliance v. Department of the Interior*, critical habitat for these units was vacated and remanded to the Service for review in November 2004.
14. This ruling stated that the economic analysis should consider economic impacts resulting from possible closures of the beach to off-road vehicle (ORV) use as well as

³ 16 U.S.C. §1533(b)(2)

⁴ Executive Order 12866, Regulatory Planning and Review, September 30, 1993; 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.

⁵ For a description of this species and the primary constituent elements that are essential to its conservation, see the Proposed Rule at 66 FR 36038-63143.

administrative costs resulting from section 7 consultation between the Service and NPS. This analysis focuses exclusively on these two sources of economic impacts.

15. With the Proposed Rule amending the previous designation, the Service has re-designated these units. The Service now identifies 1,827 acres in Dare and Hyde counties as potential critical habitat for the wintering piping plover. This proposed critical habitat is divided into four units, all of which are federally owned and part of the Cape Hatteras National Seashore. Exhibits 1-1 summarizes landownership and acreage by unit. For a map showing the location of each unit, see Appendix B.

EXHIBIT 1-1 LAND OWNERSHIP BY UNIT (ACRES)

UNIT	OWNER	ACRES
Unit NC-1 Oregon Inlet	Federal	284.0
Unit NC-2 Cape Hatteras Point	Federal	645.8
Unit NC-4 Hatteras Inlet	Federal	395.6
Unit NC-5 Ocracoke Island	Federal	501.8
Total		1827.2

1.2 REGULATORY ALTERNATIVES

16. Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives. The Service identifies four units, or areas of proposed critical habitat. The potential impacts of designating all four units are estimated in this report. An alternative to the proposed rule is to only designate a portion of the units. Section 4(b)(2) of the Act allows the Service to exclude areas proposed for designation based on economic impact and other relevant impact. Consideration of impacts at a unit level may result in alternate combinations of proposed habitat that may or may not ultimately be designated as critical habitat. As a result, the impacts of designating multiple combinations of proposed habitat are also available to the Service through this economic analysis.

1.3 APPROACH TO ESTIMATING ECONOMIC IMPACTS

17. This economic analysis considers economic efficiency effects that may result from activities to protect the wintering piping plover and its habitat (hereinafter referred to collectively as "conservation activities"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are 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 conservation activities.

1.3.1 EFFICIENCY EFFECTS

18. At the guidance of the Office of Management and Budget (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 wintering piping plover 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.⁶
19. 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, such as the US Forest Service, 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.
20. 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, a designation that precludes 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. This analysis measures both compliance costs to Federal agencies and welfare losses to recreators.

1.3.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

21. 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.⁷ 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.

⁶ 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>.

⁷ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS

For each land use activity, 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 wintering piping plover conservation activities; 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) of wintering piping plover conservation efforts from year t to T is measured in 2007 dollars according to the following standard formula:^a

$$PV_c = \sum_t^T \frac{C_t}{(1+r)^{t-2007}}$$

C_t = cost of piping plover conservation efforts in year t

r = discount rate^b

Impacts of conservation efforts 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, however, all activities employ a forecast period of 20 years, 2007 through 2026. Annualized impacts of future plover conservation activities (APV_c) are calculated by the following standard formula:

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

N = number of years in the forecast period (in this analysis, 20 years)

^a To derive the present value of past conservation activities for this analysis, t is 1998 and T is 2006; to derive the present value of future conservation efforts, t is 2007 and T is 2026.

^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.)

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

22. This analysis also considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future conservation activities for the wintering piping plover.⁸ 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 activities on the energy industry and its customers.⁹

1.4 DEFINING THE BASELINE

23. In its guidelines on preparing economic analysis, developed in accordance with the recommendations set forth in Executive Order 12866 ("Regulatory Planning and Review"), OMB directs Federal agencies to measure impacts against a baseline. OMB states, "[t]his baseline should be the best assessment of the way the world would look absent the proposed action."¹⁰ When viewed in this way, the economic impacts of critical habitat designation involve evaluating the "without critical habitat" baseline versus the "with critical habitat" scenario. Impacts of designation equal the difference, or increment, between these two scenarios.
24. In its November 2004 decision vacating and remanding critical habitat for units NC-1, NC-2, NC-4, and NC-5, the United States District Court for the District of Columbia states, "[w]hile the Tenth Circuit is correct that the ESA requires some economic analysis, it is wrong when it holds the baseline approach violates the language of the statute...With respect for the judges who found the Tenth Circuit opinion 'well-reasoned,' this Court...finds the Tenth Circuit's rejection of the baseline approach ill advised. The baseline approach is a reasonable method for assessing the actual costs of a particular critical habitat designation."¹¹
25. In light of this direction from the court, this analysis attempts to measure the incremental impact of critical habitat designation associated with ORV activity, which is considered a threat to the species and habitat. There is significant uncertainty regarding the potential impacts of this designation on ORV use, since decisions regarding closures or other management actions have not been made. Therefore, as discussed in detail in Section 2, this analysis forecasts economic impacts of critical habitat designation to ORV activities under two scenarios:
- A high-end estimate that describes the incremental impacts that could result from additional beach closures undertaken to protect plover critical habitat. This analysis assumes that incremental impacts would result from NPS closing additional areas of the beach beyond those that would be closed under current NPS management(i.e., in the absence of designation). It assumes that a percentage of all trips to these additional

⁸ 5 U.S.C. § 601 *et seq.*

⁹ Executive Order 13211, *Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001.

¹⁰ OMB, *Circular A-4*, September 17, 2003, p. 15.

¹¹ *Cape Hatteras Access Preservation Alliance v. U.S. Department of Interior* (344 F. Supp. 2d 108 (D.D.C. 2004)).

designated areas within Cape Hatteras National Seashore could be lost; and

- A low-end estimate that assumes no trips will be lost because: (a) NPS does not implement additional closures in response to the designation, (b) the additional closures that are implemented do not result in decreased level of visitation, or (c) NPS' offsetting management efforts effectively mitigate the impact of additional closures on the quality of ORV activities on the beach (i.e., ORV users do not perceive a significant loss in recreational opportunity). It is important to note that NPS currently anticipates ORV access to the beach will not be affected by the designation of critical habitat.

These scenarios define the range of incremental costs that may result from the designation of critical habitat, depending on the Service's and the U.S. National Park Service's future implementation of the regulation.

1.5 BENEFITS

26. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.¹² 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.¹³
27. 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.¹⁴ *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.*
28. 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

¹² Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

¹³ U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

¹⁴ *Ibid.*

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.

29. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. In this case, some ancillary benefits may accrue to non-ORV users. A discussion of these benefits is included in Section 2.

1.6 ANALYTIC TIME FRAME

30. The analysis estimates impacts based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. This analysis estimates economic impacts to activities from 1985 (year of the species' final listing) to 2026 (20 years from the final year anticipated in 2007). Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

1.7 INFORMATION SOURCES

31. The primary sources of information for this report were communications with and data provided by personnel from the Service and Federal action agencies. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- The Fish and Wildlife Service;
- The National Park Service; and
- Outer Banks Preservation Association.

32. In addition, this analysis relies on the Service's section 7 consultation records, public comments, and published sources. The reference section at the end of this document provides a full list of information sources.

1.8 STRUCTURE OF THE REPORT

33. The remainder of this report is organized as follows:
- Section 2: Economic Impacts on ORV Use;
 - Section 3: Administrative Costs;
 - Appendix A: Impacts on Small Entities and Energy Use;
 - Appendix B: Map of Proposed Critical Habitat;
 - Reference.

CHAPTER 3 | ADMINISTRATIVE COSTS

80. This chapter presents estimates of future administrative costs associated with the areas proposed as critical habitat under the amendment for the wintering piping plover. Included are administrative costs of actions taken by the NPS under Section 7 of the Act. First, this section estimates the costs of consultations and technical assistance efforts. Next, the section forecasts the number of technical assistance efforts and consultations likely to result from activities in the areas designated in the amendment. Based on this analysis, estimates of past and future administrative costs are derived.

3.1 ESTIMATED COSTS OF CONSULTATIONS AND TECHNICAL ASSISTANCE

81. Estimates of the cost of an individual consultation and technical assistance request were developed from a review and analysis of historical section 7 files from a number of Service field offices around the country conducted in 2002. These files addressed consultations conducted for both listings and critical habitat designations. Cost figures were based on an average level of effort of low, medium, or high complexity, multiplied by the appropriate labor rates for staff from the Service and other Federal agencies.

82. The administrative costs estimates presented in this section take into consideration the level of effect of the Service, the Action agency, and the applicant, as well as the varying complexity of the consultation or the technical assistance request. Costs associated with these consultations include the administrative costs associated with conducting the consultations, such as the costs of time spent in meetings, preparing letters, and the development of a biological opinion. Exhibit 3-1 provides a summary of the estimated administrative costs of consultations and technical assistance requests.

EXHIBIT 3-1 ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION AND TECHNICAL ASSISTANCE EFFORTS (PER EFFORT)

CONSULTATION TYPE	SERVICE	ACTION AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT
Technical Assistance	\$260-\$680	N/A	\$600-\$1,500	N/A
Informal Consultation	\$1,000-\$3,100	\$1,300-\$3,900	\$1,200-\$2,900	\$0-\$4,000
Formal Consultation	\$3,100-\$6,100	\$3,900-\$6,500	\$2,900-\$41,00	\$4,000-\$5,600
Source: IEC analysis based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2002, a review of consultation records from several Service field offices across the country. Confirmed by local Action agencies. Note: Low and high estimates primarily reflect variations in staff wages and time involvement by staff.				

3.2 SUMMARY OF PAST ADMINISTRATIVE COSTS

83. Since the listing of the species in 1985, the Service has formally consulted once with the NPS regarding its Interim Protected Species Management Strategy. This analysis assumes that NPS has also undertaken some technical assistance efforts and informal consultations in the past.³⁷ For example, following Hurricane Ophelia, NPS consulted informally on restoring access. As shown in Exhibit 3-2, past administrative costs are estimated at \$25,000 to \$64,000. Administrative costs resulting from past formal consultations are estimated to have been between \$14,000 and \$23,000 while informal consultations and technical assistance requests are estimated to have cost between \$11,000 and \$41,000 since the listing of the species.

3.3 SUMMARY OF FUTURE ADMINISTRATIVE COSTS

84. This analysis assumes that the rate of consultation will increase slightly after the designation of critical habitat. NPS will be required to consult on any activity likely to adversely affect the wintering piping plover or its habitat that was not evaluated in the Interim Protected Species Management Strategy. For example, if re-establishing access after a major storm event is likely to adversely modify habitat, the NPS would be required to consult.³⁸ NPS also may need to consult on its future ORV management plan. At this time, NPS is not undertaking any other activities on which it expects to be required to consult in the future.³⁹

85. As shown in Exhibit 3-3, future administrative costs are estimated at \$17,000 to \$42,000, assuming a seven percent discount rate over twenty years, or \$3,000 to \$7,000 annually (discounted at seven percent). This analysis does not attribute these costs to any specific unit because location of consultation will likely be park-wide (in the case of the ORV management plan) or determined by unpredictable events such as major storms.

3.4 CAVEATS

86. The number of consultations and technical assistance efforts to be undertaken in the future for activities within a given unit is highly uncertain. The frequency of such efforts will be related to the level of economic activity, the presence of management plans that obviate the need for consultation, natural events such as hurricanes, and the extent to which economic activity overlaps with critical habitat. To the extent that this analysis over or underestimates the number of these efforts in the future, estimated costs will be over or understated.

³⁷ The exact number of informal consultations and technical assistance requests is unknown. To estimate the number of informal consultations, a ratio of informal consultations to formal consultations of 2.4 to 1 was used. To estimate the number of technical assistance requests, a ratio of technical assistance requests to formal consultations of 3 to 1 was used. These ratios were based on information provided by the Service for previous analyses.

³⁸ Written communication with the Service, Raleigh Field Office, August 23, 2006.

³⁹ Personal communication, Thayer Broili, National Park Service, Cape Hatteras National Seashore, February 1, 2007.

EXHIBIT 3-2 ADMINISTRATIVE COSTS FOR THE PARK SERVICE

UNIT	TYPE OF CONSULT	PAST COSTS (1985-2006)			FUTURE COSTS (2007-2026)		
		TOTAL	TOTAL COSTS (LOW)	TOTAL COSTS (HIGH)	TOTAL	TOTAL COSTS (LOW)	TOTAL COSTS (HIGH)
All Units	Formals	1	\$14,313	\$22,962	1	\$17,721	\$28,430
	Informals	2	\$8,649	\$34,351	3	\$10,709	\$42,530
	Technical Assistance	3	\$2,657	\$6,734	4	\$3,289	\$8,338
	Total	6	\$25,619	\$64,047	8	\$31,719	\$79,297

NOTE: The number of past informal consultations and technical assistance requests is unknown. Based on discussions with the Service for other species, a ratio of technical assistance requests to formal consultations of 3 to 1 is assumed. A ratio of informal consultations to formal consultations of 2.4 to 1 is assumed. A ratio of future consultations to past consultation of 1.3 to 1 is assumed. Table may not sum due to rounding.

EXHIBIT 3-3 TOTAL FUTURE ADMINISTRATIVE COSTS, 2007-2026

UNIT	UNDISCOUNTED DOLLARS		PRESENT VALUE 3%		PRESENT VALUE 7%		ANNUALIZED 3%		ANNUALIZED 7%	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
All Units	\$32,000	\$79,000	\$24,000	\$59,000	\$17,000	\$42,000	\$2,000	\$5,000	\$3,000	\$7,000

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5 U.S.C. §§601 *et seq.*

16 U.S.C. §1533(b)(2).

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- Personal communication with Mark Hardgrove, et al, Cape Hatteras National Seashore, August 22, 2006.
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- Personal communication with Thayer Broili, Cape Hatteras National Seashore, April 2, 2007.
- Public comments of James C. Luizer on the Interim Protected Species Management Strategy, undated.
- Pub Law No. 104-121.
- 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>.
- U.S. Office of Management and Budget, Circular A-4, September 17, 2003.
- 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, Feb. 3, 2003.
- Vogelsong, Hans. Cape Hatteras National Visitor Use Study. August 2003
- Written communication with the Service, Raleigh Field Office, August 23, 2006.
- Written communication with the Service, Atlanta Regional Office, January 26, 2007.
- Written communication from Mike Murray, Park Superintendent, Cape Hatteras National Seashore, January 19, 2007.

APPENDIX A | SMALL BUSINESS AND ENERGY IMPACTS ANALYSES

87. This Appendix considers the extent to which the analytic results presented in the previous Sections reflect potential future impacts to small businesses and the energy industry. The small business analysis presented in this appendix is conducted pursuant to the RFA as amended by the SBREFA in 1996. Information was gathered from the Small Business Administration (SBA), U.S. Census Bureau, and the Risk Management Association (RMA). The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.

A.1 SBREFA ANALYSIS

88. In accordance with SBREFA, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). No regulatory flexibility analysis is required, however, 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.

89. To assist in this process, the following represents a screening level analysis of the potential for wintering piping plover conservation activities to affect small entities. This analysis is based on the estimated impacts associated with the proposed rulemaking as described in Sections 2 and 3 of this analysis. The analysis evaluates the potential for economic impacts related to two categories:

- Recreation, particularly ORV use; and
- Section 7 consultations undertaken by NPS.

90. Impacts of section 7 consultations are not anticipated to affect small entities, because the costs of consultation are borne by the action agency, in this case the NPS. The remainder of this section addresses the potential impacts to small entities that may result from economic impacts on recreation.

A.1.1 RECREATION AND ORV USE

91. This analysis estimates economic impacts associated with two possible scenarios of impacts on ORV user behavior. As described in Section 2, these scenarios are as follows:

- (1) The high bound estimates that a percentage of ORV trips to designated areas (approximately 1,630 to 2,540 trips per year on average) would be lost; and
 - (2) The low bound estimate assumes that no trips will be lost.
92. The loss of these trips will impact local businesses that serve the area, because the lost trips would have generated visitor expenditures on a variety of items including food, lodging, shopping, transportation, entertainment, and recreation (see Exhibit 2-4). Depending on the number of trips lost, lost trip expenditures could range from \$586,000 to \$881,000 annually. For the two counties containing areas proposed as critical habitat, approximately 803 businesses in affected industry sectors generate approximately \$545.9 million in annual sales. Exhibit A-1 summarizes these lost expenditures by industry sector.
93. Approximately 93 percent of businesses in affected industry sectors in both counties are small. Assuming that all expenditures are lost only by small businesses and that these expenditures are distributed equally across all small businesses in both counties, each small business may experience a reduction in annual sales of between \$349 and \$3,429, depending on its industry (see Exhibit A-2). If the small business is generating annual sales just under the SBA small business threshold for its industry, this loss represents between 0.01 and 0.04 percent of its annual sales.
94. Assuming that each small business has annual sales just under its SBA industry small business threshold may underestimate lost expenditures as a percentage of annual sales. It is likely that most small businesses have annual sales well below the threshold. However, even if a business has annual sales below the small business threshold for its particular industry, it is probable that lost expenditures still are relatively small in comparison to annual sales. For example, if a small business has annual sales that are a tenth of its SBA small business threshold, potential losses still only represent between 0.05 and 0.45 percent of its annual sales.

EXHIBIT A-1 LOST TRIP EXPENDITURES AND NUMBER OF BUSINESSES BY NAICS CODE

NAICS CODE	ANNUAL LOST TRIP EXPENDITURES (HIGH BOUND) ¹		DARE COUNTY			HYDE COUNTY		
	LOW	HIGH	NUMBER	SALES	% SMALL	NUMBER	SALES	% SMALL
Food and Beverage								
445 - Food and beverage stores	\$156,000	\$235,000	87	\$148,861,000	98%	16	\$6,832,000	100%
722 - Food Services and drinking places			287	\$129,647,000	87%	17	\$7,419,000	88%
Shopping								
448 - Clothing and clothing accessory stores	\$80,000	\$120,000	104	\$65,537,000	98%	7	Not available	100%
Lodging								
721 - Accommodation	\$263,000	\$395,000	119	\$74,654,000	93%	25	\$5,466,000	100%
Transportation								
447 - Gasoline stations	\$48,000	\$72,000	20	\$71,894,000	85%	4	\$3,513,000	100%
Entertainment and Recreation								
451 - Sporting goods, hobby, book, and music stores	\$40,000	\$60,000	109	\$30,628,000	98%	8	\$1,143,000	100%
Total	\$586,000	\$881,000	726	\$521,221,000		77	\$24,373,000	

Notes:

¹ Values based on trip expenditures identified in Exhibit 2-7 and on an average of 1,630 to 2,450 visits lost annually.Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on October 16, 2006; US Census, Summary Statistics by 2002 NAICS, accessed at: <http://www.census.gov/econ/census02/data/nc/NC000.HTM> for Dare and Hyde Counties, NC.

EXHIBIT A-2 LOST EXPENDITURES PER SMALL BUSINESS

INDUSTRY	ANNUAL LOST EXPENDITURES PER SMALL BUSINESS ¹		LOST EXPENDITURES AS A PERCENTAGE OF ANNUAL SALES ²	
	LOW	HIGH	LOW	HIGH
Food	\$426	\$641	0.01%	0.01%
Shopping	\$730	\$1,097	0.01%	0.01%
Lodging	\$1,930	\$2,902	0.03%	0.04%
Transportation	\$2,281	\$3,429	0.03%	0.04%
Entertainment	\$349	\$524	0.01%	0.01%

Notes:

¹ Assuming that all lost expenditures would have occurred at small businesses and that lost expenditures are distributed equally across all small businesses in both counties.

² Assuming that each small business has sales just under the small business threshold as defined by the Small Business Administration (SBA) for its respective industry.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

95. 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.”⁴⁰

- 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 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.⁴¹

As none of these criteria is relevant to this analysis, energy-related impacts associated with conservation efforts within the potential critical habitat are not expected.

⁴⁰ 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>.

⁴¹ Ibid.

APPENDIX B | MAP OF PROPOSED CRITICAL HABITAT

EXHIBIT B-1 MAP OF PROPOSED CRITICAL HABITAT

