



**Economic &  
Planning Systems**

*Real Estate Economics  
Regional Economics  
Public Finance  
Land Use Policy*

**DRAFT REPORT**

**ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION  
FOR THE KNEELAND PRAIRIE  
PENNY-CRESS**

Prepared for:

Division of Economics  
U.S. Fish and Wildlife Service

Prepared by:  
Economic & Planning Systems, Inc.

In association with:  
Industrial Economics, Incorporated

April 17, 2002

EPS #12412

BERKELEY  
2501 Ninth St., Suite 200  
Berkeley, CA 94710-2515  
[www.epsys.com](http://www.epsys.com)

Phone: 510-841-9190  
Fax: 510-841-9208



SACRAMENTO  
Phone: 916-649-8010  
Fax: 916-649-2070

DENVER  
Phone: 303-623-3557  
Fax: 303-623-9049

## TABLE OF CONTENTS

---

	<u>PAGE</u>
PREFACE .....	1
EXECUTIVE SUMMARY AND REPORT ORGANIZATION .....	3
Critical Habitat Designation .....	3
Framework and Economic Impacts Considered .....	3
Findings .....	5
Organization of Report .....	6
I. INTRODUCTION & BACKGROUND .....	8
Species Description and Distribution .....	8
Proposed Critical Habitat Designation .....	9
Framework for Analysis .....	10
Methodological Approach .....	12
II. SOCIO-ECONOMIC AND INFRASTRUCTURE CONTEXT .....	13
Population and Housing .....	13
Economy .....	14
Public Infrastructure .....	14
III. LAND USE EFFECTS OF SECTION 7 .....	17
Land Ownership .....	17
Potential Effects of Critical Habitat Designation on Land Use .....	17
IV. ESTIMATED SECTION 7 COSTS .....	25
Kneeland Airport Effects .....	25
Stigma Effects .....	38
V. SMALL BUSINESS REGULATORY ENFORCEMENT ACT .....	39
VI. BENEFITS OF CRITICAL HABITAT DESIGNATION .....	40

**LIST OF TABLES**

---

	<u>PAGE</u>
Table 1: Summary of Economic Impacts (20 Year Total) . . . . .	7
Table 2: Annual Aircraft Operations at Humboldt County Airports . . . . .	19
Table 3: Kneeland Airport Current and Projected Annual Operations . . . . .	21
Table 4: Service Formal Consultation Costs for Airport Improvement Project . . . . .	27
Table 5: Average Shipping Rates and Costs to Eureka, California . . . . .	33
Table 6: Economic Cost of Airport Closure without Replacement (20 Year Total) . . .	36

## PREFACE

---

The U.S. Fish and Wildlife Service has added this preface to all economic analyses of critical habitat designations:

"The standard best practice in economic analysis is applying an approach that measures costs, benefits, and other impacts arising from a regulatory action against a baseline scenario of the world without the regulation. Guidelines on economic analysis, developed in accordance with the recommendations set forth in Executive Order 12866 ("Regulatory Planning and Review"), for both the Office of Management and Budget and the Department of the Interior, note the appropriateness of the approach:

*'The baseline is the state of the world that would exist without the proposed action. All costs and benefits that are included in the analysis should be incremental with respect to this baseline.'*

"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 a designation equal the difference, or the increment, between these two scenarios. Measured differences between the baseline and the scenario in which critical habitat is designated may include (but are not limited to) changes in land use, environmental quality, property values, or time and effort expended on consultations and other activities by federal landowners, federal action agencies, and in some instances, State and local governments and/or private third parties. Incremental changes may be either positive (benefits) or negative (costs).

"In *New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10<sup>th</sup> Cir. 2001), however, the 10th Circuit recently held that the baseline approach to economic analysis of critical habitat designations that was used by the Service for the southwestern willow flycatcher designation was 'not in accord with the language or intent of the ESA.' In particular, the court was concerned that the Service had failed to analyze any economic impact that would result from the designation, because it took the position in the economic analysis that there was no economic impact from critical habitat that was incremental to, rather than merely co-extensive with, the economic impact of listing the species. The Service had therefore assigned all of the possible impacts of designation to the listing of the species, without acknowledging any uncertainty in this conclusion or considering such potential impacts as transaction costs, reinitiations, or indirect costs. The court rejected the baseline approach incorporated in that designation, concluding that, by obviating the need to perform any analysis of economic impacts, such an approach rendered the economic analysis requirement meaningless: 'The statutory language is plain in requiring some kind of consideration of economic impact in the CHD phase.'

"In this analysis, the Service addresses the 10th Circuit's concern that we give meaning to the ESA's requirement of considering the economic impacts of designation by acknowledging the uncertainty of assigning certain post-designation economic impacts (particularly section 7 consultations) as having resulted from either the listing or the designation. The Service believes that for many species the designation of critical habitat has a relatively small economic impact, particularly in areas where consultations have been ongoing with respect to the species. This is because the majority of the consultations and associated project modifications, if any, already consider habitat impacts and as a result, the process is not likely to change due to the designation of critical habitat. Nevertheless, we recognize that the nationwide history of consultations on critical habitat is not broad, and, in any particular case, there may be considerable uncertainty whether an impact is due to the critical habitat designation or the listing alone. We also understand that the public wants to know more about the kinds of costs consultations impose and frequently believe that designation could require additional project modifications.

"Therefore, this analysis incorporates two baselines. One addresses the impacts of critical habitat designation that may be 'attributable co-extensively' to the listing of the species. Because of the potential uncertainty about the benefits and economic costs resulting from critical habitat designations, we believe it is reasonable to estimate the upper bounds of the cost of project modifications based on the benefits and economic costs of project modifications that would be required due to consultation under the jeopardy standard. It is important to note that the inclusion of impacts attributable co-extensively to the listing does not convert the economic analysis into a tool to be considered in the context of a listing decision. As the court reaffirmed in the southwestern willow flycatcher decision, 'the ESA clearly bars economic considerations from having a seat at the table when the listing determination is being made.'

"The other baseline, the lower boundary baseline, will be a more traditional rulemaking baseline. It will attempt to provide the Service's best analysis of which of the effects of future consultations actually result from the regulatory action under review - i.e. the critical habitat designation. These costs will in most cases be the costs of additional consultations, reinitiated consultations, and additional project modifications that would not have been required under the jeopardy standard alone as well as costs resulting from uncertainty and perceptual impacts on markets."

DATED: March 20, 2002

## **EXECUTIVE SUMMARY AND REPORT ORGANIZATION**

---

1. The purpose of this report is to identify and analyze the potential economic effects of the proposed designation of critical habitat for the Kneeland Prairie penny-cress (*Thlaspi californicum*). This report has been prepared by Economic & Planning Systems, Incorporated, under subcontract to Industrial Economics, Incorporated, for the U.S. Fish and Wildlife Service's Division of Economics.
2. Section 4(b)(2) of the Endangered Species Act (the Act) requires the U.S. Fish and Wildlife Service (the Service) to designate critical habitat on the basis of the best scientific data available, after taking into consideration the economic effect, and any other relevant effect, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.
3. The focus of this economic analysis is on section 7 of the Act, which requires Federal agencies to insure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. Federal agencies are required to consult with the Service whenever they propose a discretionary action that may affect a listed species or its designated critical habitat. Aside from the protection that is provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 only applies to activities that involve Federal permits, funding or involvement, the designation of critical habitat will not afford any additional protections for species with respect to such strictly private activities.

## **CRITICAL HABITAT DESIGNATION**

4. On October 24, 2001, the Service proposed designation of one 74-acre unit of critical habitat for the Kneeland Prairie penny-cress (hereafter "penny-cress") in Humboldt County, California. The penny-cress is a perennial member of the mustard family endemic to northern California. The critical habitat unit is located approximately 14 miles east of Eureka, California and consists primarily of serpentine soil outcrops, perennial grasslands, seasonal and perennial wetlands, and mixed oak and Douglas-fir woodlands. The habitat unit encompasses land owned by five landowners: Humboldt County, the California Department of Forestry and Fire Protection (CDF), the Pacific Lumber Company, and two private landowners. The penny-cress was officially listed as an endangered plant species on February 9, 2000.

## **FRAMEWORK AND ECONOMIC IMPACTS CONSIDERED**

5. This analysis first identifies land use activities within or in the vicinity of those areas being proposed for critical habitat that are likely to be affected by section 7 of the Act. To do this, the

analysis evaluates a "without section 7" scenario and compares it to a "with section 7" scenario. The "without section 7" scenario constitutes the baseline of this analysis. It represents the level of protection currently afforded the species under the Act, absent section 7 protective measures, which includes other Federal, State, and local laws. The "with section 7" scenario identifies land-use activities likely to involve a Federal nexus that may affect the species or its designated critical habitat, which accordingly have the potential to be subject to future consultations under section 7 of the Act.

6. Economic activities identified as likely to be affected under section 7 and the resulting impacts that section 7 can have on such activities constitute the upper-bound estimate of the proposed critical habitat economic analysis. By defining the upper-bound estimate to include both jeopardy and critical habitat impacts, the analysis recognizes the difficulty in sometimes differentiating between the two in evaluating only the critical habitat effects associated with the proposed rulemaking. This step is adopted in order to ensure that any critical habitat impacts that may occur co-extensively with the listing of the species (i.e., jeopardy) are not overlooked in the analysis.
7. Upon identifying section 7 impacts, the analysis proceeds to consider the subset of impacts that can be attributed exclusively to the critical habitat designation. To do this, the analysis adopts a "with and without critical habitat approach." This approach is used to determine those effects found in the upper-bound estimate that may be attributed solely to the proposed designation of critical habitat. Specifically, the "with and without critical habitat" approach considers section 7 impacts that will likely be associated with the implementation of the *jeopardy* provisions of section 7 and those that will likely be associated with the implementation of the *critical habitat* provision of section 7. In many cases, impacts associated with the jeopardy standard remain unaffected by the designation of critical habitat and thus would not normally be considered an effect of a critical habitat rulemaking. The subset of section 7 impacts likely to be affected solely by the designation of critical habitat represents the lower-bound estimate of this analysis.
8. Two primary categories of potential costs are considered in the analysis. These categories are:
  - Costs associated with identifying the effect of the designation on a particular parcel or land use activity (e.g., technical assistance, section 7 consultations).
  - Costs associated with any modifications to projects, activities, or land uses resulting from the outcome of section 7 consultations with the Service.

## **FINDINGS**

9. The key findings are described below. Economic cost estimates are presented in **Table 1**.
- The only existing or proposed activity that will require consultation with the Service is the proposed Kneeland Airport improvement project. This project involves runway stabilization and restoration and parking area re-location. The project is expected to require a formal consultation. Total costs associated with formal consultation are expected to total \$20,300, including \$6,000 to the Service, \$5,200 to the Federal Aviation Administration (FAA), and \$9,100 to the County.
  - The most likely outcome of the formal consultation process is that the Service will either approve the airport proposal as presented by the County, or it may recommend minor project modifications. The precise nature of any recommended project modifications is difficult to predict in advance of the actual consultation. One estimate of the type of modifications that might be recommended implies a section 7-related cost of \$113,000. These costs are attributable co-extensively to the listing of the penny-cress.
  - A possible, but unlikely consultation outcome, is that the project would be found to jeopardize the species and/or adversely modify critical habitat, and the Service would be unable to identify reasonable and prudent alternatives. Such an outcome is extremely rare.<sup>1</sup> In most cases across the country where jeopardy and/or adverse modification is identified, the local field office is able to identify reasonable and prudent alternatives. To be comprehensive, however, and consider all the possible outcomes, this analysis considers a finding that results in the closure of Kneeland Airport. As a result, the economic costs associated with the loss of airport operation and/or the cost of constructing a new airport would be incurred. If no new airport is constructed, the net present value of the economic cost, considered over twenty years, will be between \$169,000 and \$1.1 million, depending on the discount rate applied. If a new airport is constructed in ten years, the net present value of the interim economic losses and ultimate construction cost, considered over twenty years, will be between \$3.0 million and \$4.2 million, depending on the discount rate applied. These costs are attributable co-extensively to the listing of the penny-cress. If no replacement airport is constructed, additional losses, outside the scope of this economic analysis, include public safety function losses.
  - Other potential effects include stigma effects on private land associated with uncertainty over the implementation of the proposed critical habitat designation as well as effects on small businesses. Stigma effects may reduce the value of private land if regulatory uncertainties result in a reduced market-wide demand for land in the proposed habitat

---

<sup>1</sup>For example, in the 62 biological opinions regarding other species issued by the Service's Arcata field office, none have resulted in a jeopardy finding. (E-mail communication with Biologist, Arcata Field Office, U.S. Fish and Wildlife Service, April 16, 2002.)

unit. No information is currently available on the likely magnitude of this effect. Stigma effects are solely attributable to critical habitat designation. None of the described economic effects impose an undue burden on any "small entity" as defined in the Small Business Regulatory Enforcement Fairness Act.

- Potential benefits of section 7 implementation to protect the penny-cress and its proposed habitat include improved ecosystem health, water quality and flood control; and increased property values due to protection of aesthetically pleasing open spaces. However, it is difficult at this time to estimate the total benefit afforded by section 7 implementation on the proposed designation, since little information is available regarding the following: (1) the likely benefits of each consultation and modification; and (2) the extent to which such consultations and modifications would result from the designation of critical habitat.

## **ORGANIZATION OF REPORT**

10. This report is organized into six chapters. **Chapter I** provides an introduction, describes the species and its habitat, and lays out the framework and methodology for the analysis. **Chapter II** describes the County's socio-economic and infrastructure context. **Chapter III** determines which land use activities will potentially be affected by section 7. **Chapter IV** estimates the economic costs associated with section 7 and critical habitat designation. **Chapter V** presents the Small Business Regulatory Enforcement Act analysis, and **Chapter VI** discusses the benefits of critical habitat designation.

<b>Table 1</b>							
<b>SUMMARY OF ECONOMIC IMPACTS (20 year total)</b>							
<b>DRAFT ECONOMIC ANALYSIS: KNEELAND PRAIRIE PENNY-CRESS</b>							
Affected Projects/ Consultation Outcomes	Section 7 Consultation Costs				Section 7 Project Modification Costs	Costs Attributable to Critical Habitat	
	Service	FAA	Humboldt County	Total			
<b>Kneeland Airport</b>							
Scenario 1 (Most Likely)	Continued Airport Operation	\$6,000	\$5,200	\$9,100	\$20,300	\$113,000	none
Scenario 2, Outcome I (Unlikely)	Airport Closure, No Replacement	\$6,000	\$5,200	\$9,100	\$20,300	\$169,000 to \$1.1 million <sup>(3), (4)</sup>	none
Scenario 2, Outcome II (Unlikely)	Airport Closure, Replacement	\$6,000	\$5,200	\$9,100	\$20,300	\$3.0 to \$4.2 million <sup>(3)</sup>	none
<b>Stigma Impacts</b>							
All Stigma Impacts		none	none	none	none	Stigma	Stigma
(1) Consultation costs are for a formal consultation. (2) Stigma costs are the only costs solely associated with critical habitat designation. They are not quantified due to lack of information. (3) Range defined by application of discount rates of 7 and 3 percent, respectively, to the stream of economic costs/ losses over time. (4) Economic cost estimates do not include unquantifiable effects such as loss of public safety function.							
Source: U.S. Fish and Wildlife Service; Humboldt County; Industrial Economics, Incorporated; Economic & Planning Systems, Inc.							

## I. INTRODUCTION & BACKGROUND

---

11. On October 24, 2001, the U.S. Fish and Wildlife Service (the Service) proposed designating critical habitat for the Kneeland Prairie penny-cress (*Thlaspi californicum*) on approximately 74 acres of land in eastern Humboldt County, California. The purpose of this report is to identify and analyze the potential economic effects that would result from this designation. This report was prepared by Economic & Planning Systems, Incorporated (EPS), in association with Industrial Economics, Incorporated (IEc), under contract to the Service's Division of Economics.
12. Section 4(b)(2) of the Endangered Species Act (the Act) requires that the Service base the designation of critical habitat upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.
13. Under the listing of a species, section 7(a)(2) of the Act requires Federal agencies to consult with the Service in order to ensure that activities they fund, authorize, permit, or carry out are not likely to jeopardize the continued existence of the species. The Service defines jeopardy as any action that would appreciably reduce the likelihood of both the survival and recovery of the species. For designated critical habitat, section 7(a)(2) also requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, permit, or carry out do not result in destruction or adverse modification of critical habitat. Adverse modification of critical habitat is defined as any direct or indirect alteration that appreciably diminishes the value of critical habitat for the survival and recovery of a listed species.

## SPECIES DESCRIPTION AND DISTRIBUTION

14. The penny-cress is an endemic California plant species found in a limited geographic area of Humboldt County, near the town of Kneeland, California. The penny-cress is a perennial member of the mustard plant family (*Brassicaceae*). It stands approximately 3.7 to 4.9 inches tall, and is characterized by a basal cluster of green, sparsely toothed leaves, and white flowers with strongly ascending flower stalks. The penny-cress flowers from April to June and is difficult to identify or differentiate from surrounding forbs when not in bloom.
15. The current known range of the penny-cress is limited to approximately 0.8 acres of serpentine soils in Kneeland Prairie, in the outer north coast range of Humboldt County, approximately 14 miles east of Eureka, California. The only known suitable habitat for the penny-cress is a small number of exposed serpentine outcrops on the portion of Ashfield Ridge that crosses Kneeland Prairie at elevations between 2,600 to 2,760 feet. Serpentine soils are characterized by high concentrations of heavy metals, particularly magnesium and iron, and are therefore often inhospitable to the growth of plants that are not specifically adapted to this soil type. Plant species that are well adapted to serpentine soils often face less competition from other species. The area surrounding these outcrops and associated soils consists of perennial grasslands, seasonal and perennial wetlands, and mixed oak and Douglas-fir woodlands.

16. The 2001 penny-cress population was estimated at approximately 5,293 individuals divided among five distinct colonies all located within 980 feet of each other. The largest of these colonies encompasses approximately 0.72 acres and contains approximately 97 percent of the identified individuals. A 1997 survey estimated the total number of plants to be approximately 10,099, indicating that the total population has since declined by approximately 48 percent. Insufficient data is available to determine whether this decline is within the range of normal density fluctuations for the species or whether it represents a more significant trend with respect to species survival. The construction of the county road and the Kneeland Airport removed habitat and fragmented otherwise connected patches of suitable habitat, contributing to the decline in penny-cress numbers.

## PROPOSED CRITICAL HABITAT DESIGNATION

17. The penny-cress was listed as an endangered species pursuant to the Act on February 9, 2000. When a species is listed as threatened or endangered, the Act stipulates that the Service must also "to the maximum extent prudent and determinable...designate critical habitat."<sup>2</sup> On October 24, 2001, the Service published in the Federal Register a proposed rule outlining its proposed critical habitat designation for the penny-cress. The proposed rule delineated one 74-acre critical habitat unit comprising all currently known penny-cress colonies as well as a number of unoccupied nearby serpentine soil outcroppings that the Service determined contained physical or biological features necessary for both the survival and recovery of the species.
18. Section 3 (5) (A) of the Act defines critical habitat as "the specific areas within the geographic area occupied by a species...on which are found those physical or biological features... essential to the conservation of the species and...specific areas outside the geographic area occupied by a species...upon a determination that such areas are essential for the conservation of the species."<sup>3</sup> In order to delineate potential critical habitat boundaries, the Service must first use the best available scientific information to identify those physical and biological features — or primary constituent elements (PCEs) — that are necessary for both the recovery and survival of the species. The Service identified the following four PCEs of critical penny-cress habitat:
- Thin, rocky soils that have developed on exposures of serpentine substrates;
  - Plant communities that support a relatively sparse assemblage of serpentine indicator and facultative-serpentine indicator species;
  - Serpentine substrates that contain 15 percent or greater of exposed gravel, cobbles, or larger rock fragments; and
  - Prairie grasslands and oak woodlands located within 30 meters (100 ft) of the serpentine outcrop area on Ashfield Ridge.
19. The Service used the first three PCEs to delineate potentially suitable penny-cress habitat in proximity to its known current range. Suitable habitat patches outside the current range of the

---

<sup>2</sup> 16 U.S.C. § 1531 *et. seq.* (1994).

<sup>3</sup> *Ibid.*

species were included as critical habitat in order to secure the possibility of future re-colonization and/or expansion by minimizing the loss of potential future habitat and to reduce the likelihood of extinction due to stochastic events. These isolated habitat patches comprise a combined area of approximately 4.2 acres. Once potentially suitable habitat was identified and mapped, all surrounding grasslands and oak woodland habitat within 30 meters (100 feet) of identified suitable habitat patches was included as critical habitat according to the fourth PCE. This delineated area contains the PCEs necessary for the continued survival and recovery of the penny-cress and is approximately 50.2 acres in size.

20. Finally, the proposed critical habitat unit was defined by using geographic information system (GIS) to superimpose a 100-meter Universal Transverse Mercator (UTM) grid on top of the PCE delineation described above. Grid sections that overlapped with the PCE map were included as part of the unit. The resulting polygonal unit boundary encompasses approximately 74 acres.

## **FRAMEWORK FOR ANALYSIS**

21. The focus of this economic analysis is on section 7 of the Act, which requires Federal agencies to insure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. Federal agencies are required to consult with the Service whenever they propose a discretionary action that may affect a listed species or its designated critical habitat. Aside from the protection that is provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 only applies to activities that involve Federal permits, funding or involvement, the designation of critical habitat will not afford any additional protections for species with respect to such strictly private activities.
22. This analysis first identifies land use activities within or in the vicinity of those areas being proposed for critical habitat that are likely to be affected by section 7 of the Act. To do this, the analysis evaluates a "without section 7" scenario and compares it to a "with section 7" scenario. The "without section 7" scenario constitutes the baseline of this analysis. It represents the level of protection currently afforded the species under the Act, absent section 7 protective measures, which includes other Federal, State, and local laws. The "with section 7" scenario identifies land-use activities likely to involve a Federal nexus that may affect the species or its designated critical habitat, which accordingly have the potential to be subject to future consultations under section 7 of the Act.

23. Economic activities identified as likely to be affected under section 7 and the resulting impacts that section 7 can have on such activities constitute the upper-bound estimate of the proposed critical habitat economic analysis. By defining the upper-bound estimate to include both jeopardy and critical habitat impacts, the analysis recognizes the difficulty in sometimes differentiating between the two in evaluating only the critical habitat effects associated with the proposed rulemaking. This step is adopted in order to ensure that any critical habitat impacts that may occur co-extensively with the listing of the species (i.e., jeopardy) are not overlooked in the analysis.
24. Upon identifying section 7 impacts, the analysis proceeds to consider the subset of impacts that can be attributed exclusively to the critical habitat designation. To do this, the analysis adopts a “with and without critical habitat approach.” This approach is used to determine those effects found in the upper-bound estimate that may be attributed solely to the proposed designation of critical habitat. Specifically, the “with and without critical habitat” approach considers section 7 impacts that will likely be associated with the implementation of the *jeopardy* provisions of section 7 and those that will likely be associated with the implementation of the *critical habitat* provision of section 7. In many cases, impacts associated with the jeopardy standard remain unaffected by the designation of critical habitat and thus would not normally be considered an effect of a critical habitat rulemaking. The subset of section 7 impacts likely to be affected solely by the designation of critical habitat represent the lower-bound estimate of this analysis.
25. The critical habitat designation for the penny-cress encompasses land under private, County, and State ownership. For private, County, and State lands subject to critical habitat designation, section 7 consultations and modifications to land uses and activities can only be required when a Federal nexus, or connection, exists. A Federal nexus arises if the activity or land use of concern involves Federal permits, Federal funding, or another form of Federal involvement. Section 7 consultations are not required for activities on non-Federal lands that do not involve a Federal nexus.
26. This report estimates impacts of listing and critical habitat designation 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. Accordingly, the analysis focuses on activities that are likely to occur within a ten-year time horizon.<sup>4</sup>

---

<sup>4</sup> One of the activities identified as likely to take place within the next ten years (repair of Kneeland airport) considers the magnitude of a stream of costs over a twenty-year period, because the impacts of critical habitat on this action can be reasonably measured as a stream of costs extending into the future.

## **METHODOLOGICAL APPROACH**

27. This report relies on a sequential methodology and focuses on distilling the salient and relevant aspects of potential economic impacts of designation. The methodology consists of:
- Determining the current and projected economic activity within and around the proposed critical habitat area;
  - Considering how current and future activities that take place or will likely take place on the Federal and private land could adversely affect proposed critical habitat;
  - Identifying whether such activities taking place on privately-owned property within the proposed critical habitat boundaries are likely to involve a Federal nexus;
  - Evaluating the likelihood that identified Federal actions and non-Federal actions having a Federal nexus will require consultations under section 7 of the Act and, in turn, that such consultations will result in modifications to projects;
  - Estimating per-unit costs of expected section 7 consultations, project modifications and other economic impacts associated with activities in or adjacent to areas proposed as critical habitat;
  - Estimating the upper bound of total costs associated with the area proposed for the designation (including costs that may be attributed co-extensively with the listing of the species) and the lower bound of costs (i.e., costs attributable solely to critical habitat);
  - Determining the benefits that may be associated with the designation of critical habitat; and
  - Assessing the extent to which critical habitat designation will create costs for small businesses and/or affect property values as a result of modifications or delays to projects.

## II. SOCIO-ECONOMIC AND INFRASTRUCTURE CONTEXT

---

28. Humboldt County is the second most northern coastal county in California, encompassing about 3,600 square miles. The County is generally mountainous, especially inland from the coast, and is dominated by coniferous forests interspersed with grass or chaparral covered slopes. It is remote relative to major metropolitan areas and has experienced consistent, but slow growth over the last twenty years. It has historically relied on its natural resource endowments to support the inter-related variables of economic growth, quality of life, and resident/visitor attraction. Like other regions, the County plays an important role in maintaining this quality of life with the provision of public infrastructure and public services, and faces a number of challenges including balancing both competing land use needs and competing public infrastructure needs.

### POPULATION AND HOUSING

29. Humboldt County includes seven incorporated cities and a number of unincorporated communities. Humboldt County's 2000 population was about 127,600 persons. A little over 50 percent live in unincorporated areas of the Counties, about 67,600 persons, and a little less than 50 percent live in the cities, about 60,000 persons. Cities with the greatest population include Eureka with about 27,500 persons, Arcata with 16,400 persons, and Fortuna with 10,200 persons. County population grew by about 8,500 between 1990 and 2000, representing an annual growth rate of about 0.7 percent, less than half the average growth rate for the State of California as a whole. Population grew by about 5,400 in unincorporated areas and 3,100 in incorporated areas. Among incorporated areas, the cities of Fortuna and Arcata experienced the greatest growth, both adding over 1,000 persons over the decade.<sup>5</sup>
30. This population growth generated a corresponding demand for residential real estate. Over this same period, the housing stock grew from about 51,100 to 56,700 units, a growth of about 5,800 units. About 2,100 of these units were in cities and 3,700 were in unincorporated areas. Of the net new residential units in the cities, a little over half were single family homes and a little under half were multi-family units. In the unincorporated area, about 80 percent were single family units, 13 percent multi-family, and 7 percent mobile homes.<sup>6</sup> A large portion of new housing stock in the unincorporated areas was added in established unincorporated communities while a smaller portion of residential units was added on larger lot rural residential homesites spread throughout the County.

---

<sup>5</sup> United States Department of Commerce, U.S. Census Bureau, *United States Census 2000*, [www.census.gov](http://www.census.gov).

<sup>6</sup> *Ibid.*

## ECONOMY

31. Humboldt County's economy provides a total of about 51,100 jobs in the farming, goods-producing, and service-producing industrial sectors. Total farm employment (excluding timber production) is 1,200, total goods producing is 7,700, and total service producing is 42,200. Goods-producing employment includes 1,700 persons employed in construction and mining, and 6,000 in manufacturing, of which 3,700 are engaged in lumber and wood production. Services producing employment includes 13,000 government jobs, 13,000 services jobs, 2,200 finance, insurance and real estate jobs, 12,300 trade jobs, and 1,700 transportation and public utilities jobs. Among the service-producing jobs, 900 work in hotel and other lodging, 700 in amusement and recreation, and 3,700 in eating and drinking places.<sup>7</sup>
32. Historically, the County's main export industry sectors have relied on the County's rich resource base, including resource-extraction industries such as timber, fisheries, and agriculture, as well as resource enjoyment-related industries including outdoor recreation and tourism. There are about 12,000 jobs (almost 25 percent of all County jobs) directly associated with the County's natural resources. About 6,000 are associated with agriculture, timber production, and mining, and about 6,000 associated with tourism.<sup>8</sup> In 1999, the County produced about 385 million board-feet in timber production, 18 percent of total State production.<sup>9</sup> Total farm-gate values of agricultural production in 2000, including timber production, were \$382 million. Timber production and miscellaneous products dominated this value with \$285 million, with livestock and poultry and associated products contributing \$55 million, and nursery products \$33 million.
33. In recent years, the total civilian labor force has remained constant, with no net change in the 60,400-person labor force between 1994 and 2000. The seasonal and cyclical nature of employment in several local industries such as timber production and the relatively high unemployment rates - consistently over 7 percent - have led to an out-migration of some workers. At the same time, with the onset of the new economy in the late 1990's, some new labor has located to Humboldt County, now able to take advantage of the County's quality of life while conducting business over the Internet. Between 1990 and 2000, total jobs in all industry sectors increased from 44,900 to 50,600, an increase of 5,700 jobs. The annual growth rate was 1.2 percent, a little below the 1.5 percent annual growth rate for California as a whole. Average annual earnings per job in 1998 was about \$25,000.

## PUBLIC INFRASTRUCTURE

34. The economic and community vitality of Humboldt County depend, as in other communities, on publicly provided or supported infrastructure and services as well as employment opportunities and housing options. The public infrastructure provided in Humboldt County, which includes

---

<sup>7</sup> California Employment Development Department, Labor Market Information, *Labor Force and Industry Employment March 2000 Benchmark*, [www.calmis.ca.gov](http://www.calmis.ca.gov).

<sup>8</sup> Ibid.

<sup>9</sup> California State Board of Equalization, *California Timber Harvest by County, 2000*.

transportation systems, water and wastewater systems, parks, and natural resources, all contribute to the County's quality of life. Two of these infrastructure components, its transportation system and its natural resources, are described below.

- **Transportation Systems.** Transportation systems including roads, trails, public transit, and airports are all important to the movement of people, goods and services, both within and beyond the County, for personal and business reasons. Strong transportation systems will factor into businesses location decisions, reduce time lost to travel, and improve overall economic vitality. In Humboldt County, general access for personal and business reasons is provided through commercial air carrier flights as well as personal and business-related private flights. The airports also provide venues for aviation-related education and recreation.

The County currently has nine airports, including one air carrier airport, the Arcata-Eureka airport in McKinleyville. General aviation uses, including recreational and business uses, are provided at all airports, including Arcata-Eureka, Eureka Municipal, Dinsmore, Garberville, Hoopa, Willow Creek, Kneeland, Murray Field and Rohnerville. These airports also provide landing facilities for emergencies such as floods, forest fires, and medical evacuations. The Coast Guard uses the Arcata-Eureka Airport for search and rescue operations and the California Department of Forestry and Fire Protection (CDF) uses Rohnerville Airport as the Air Attack Base for wildland fire suppression aircraft. Kneeland airport, the most remote airport with no storage facilities or personnel, lies at the highest elevation, and acts as a safety valve for private pilots unable to land elsewhere due to inclement weather, and as a back-up for some small package delivery planes if Murray Field and Arcata-Eureka are inaccessible.

- **Natural Resources.** The preservation and sustainable use of natural resources can provide a broad range of benefits, including direct economic benefits through agricultural and timber production and tourist attraction, as well as a broad range of public benefits through the ecosystem services provided by natural resources.

High levels of precipitation in combination with the mild climate of the North Coastal Basin supports a wide range of fish, wildlife, and plants and the habitats they depend on. The County is generally mountainous, especially inland from the coast, and is dominated by coniferous forests interspersed with grass or chaparral covered slopes. As a result, timber production and livestock grazing are the primary agricultural activities. The general types of habitat and associated vegetation that are found in the County include coastal coniferous forest on chaparral, pine-fir woodland on riparian, foothill woodland on salt marsh, grasslands on aquatic habitat, cultivated pasture on near-shore zone, and coastal dunes on tidal zone.

Natural communities threatened by loss or reduction in the County include wetlands, old-growth redwood forests, and coastal dunes. The County has developed a biological resources map to help preserve these areas. Habitats suitable for agricultural production are also threatened by urban growth and rural residential development, though Right-to-Farm Ordinances, Williamson Act contracts, and other preservation tools have been adopted by the County to support agriculture.

### **III. LAND USE EFFECTS OF SECTION 7**

---

35. This Chapter describes the existing set of landowners in the proposed critical habitat area and the potential effects of Section 7 on land uses. **Chapter IV** quantifies the potential economic impacts associated with the proposed designation.

#### **LAND OWNERSHIP**

36. The 74 acres of land in the proposed critical habitat unit is divided among five primary landowners, including the following:
- Humboldt County, which owns Kneeland Airport and the Mountain View Road (approximately 8 acres);
  - State of California, which owns a helipad, including its surrounding buildings and fueling structures (approximately 4 acres); and,
  - Three private landowners, including the Pacific Lumber Company and two individual landowners, who together own the remaining 62 acres.
37. There is no Federally owned land within the proposed habitat unit. The majority of the area currently occupied by the penny-cress is owned by one of the private landowners.

#### **POTENTIAL EFFECTS OF CRITICAL HABITAT ON LAND USE**

38. There are a number of existing and proposed activities inside or adjacent to the proposed critical habitat unit boundary, including County airport use, County airport herbicide application, County road uses, CDF helipad uses, and grazing uses. Activities with a Federal nexus, which trigger section 7 requirements, are, however, proposed for only one parcel, the County airport. No activities are proposed on State or private lands included in the proposed designation that would involve a Federal nexus. Therefore, direct section 7 impacts are not expected on these parcels. In addition, independent of a Federal nexus, the stigma of critical habitat designation may in some cases affect land and property values. The remainder of this section describes the proposed airport activities with a Federal nexus and the potential outcomes of section 7 consultation. It also explains the potential stigma impacts.

#### **KNEELAND AIRPORT**

39. Humboldt County is served by nine airports, including four coastal airports and five inland airports. Arcata-Eureka (seven miles north of Arcata along Highway 101) Murray Field (3 miles east of Eureka), and Rohnerville (3 miles southeast of Fortuna and 20 miles south of Eureka along Highway 101) are the busiest airports, with over 75 percent of annual general aviation aircraft

operations. The Kneeland Airport is the smallest of the nine airports in Humboldt County, consisting of one 2,240-foot by 50-foot runway with a small tiedown apron midfield. This non-passenger airport has no permanent structures, is unlighted and unmanned, and provides no services. Kneeland Airport is not a destination for flights. It either acts as a location for flight training or as a refuge airport or cargo unloading airport for small planes when the County's larger airports are closed due to inclement weather. All of the aircraft that use Kneeland are small, basic utility aircraft, weighing less than 12,500 pounds with approach speeds of below 121 knots. The most recent data for airport activities at other airports in the County is Federal Aviation Administration (FAA) National Flight Data Center, and is shown in **Table 2**.<sup>10</sup> The latest estimates of operations at Kneeland Airport from the Kneeland Airport Master Plan, Public Review Draft, February 2002 (2002 Draft Master Plan) suggest that about 3 percent of annual aircraft operations at County airports occur at Kneeland Airport.<sup>11</sup>

---

<sup>10</sup> FAA National Flight Center structured in accordance with FAA Airport Master Record (FAA Form 5010-1) by g.c.r. & associates, incorporated; www.gcr1.com.

<sup>11</sup> Shutt Moen Associates, Kneeland Airport Master Plan, Public Review Draft, February 15, 2002 (2002 Draft Master Plan).

<b>Table 2</b>						
<b>ANNUAL AIRCRAFT OPERATIONS AT HUMBOLDT COUNTY AIRPORTS *</b>						
<b>DRAFT ECONOMIC ANALYSIS: KNEELAND PRAIRIE PENNY-CRESS</b>						
<b>Item</b>	<b># of Runways</b>	<b>Longest Runway (feet)</b>	<b>Elevation (feet)</b>	<b>Driving Time to Eureka/ Coast</b>	<b>Annual Operations (1)</b>	<b>% of Total</b>
<b>Coastal</b>						
Arcata-Eureka	2	5,998	218	--	65,000	32.3%
Murray Field	2	3,010	7	--	65,000	32.3%
Shelter Cove	1	3,400	69	--	15,000	7.5%
Eureka Municipal	<u>1</u>	2,700	20	--	5,000	2.5%
Subtotal	6	--	--	--	150,000	74.6%
<b>Inland</b>						
Rohnerville (2)	1	4,025	392	30 mins.	27,500	13.7%
Garberville	1	3,045	546	1 hr 30 mins.	15,000	7.5%
Kneeland	1	2,240	2,737	40 mins.	6,000	3.0%
Dinsmore	1	2,510	2,375	1 hr 50 mins.	1,600	0.8%
Hoopa	<u>1</u>	2,320	356	1 hr 20 mins.	1,000	0.5%
Subtotal	5	--	--	--	51,100	25.4%
<b>Total</b>	<b>11</b>	--	--	--	<b>201,100</b>	<b>100%</b>
<p>* Excludes air carrier, commuter, air taxi, and military related aircraft operations.</p> <p>(1) One take-off or one landing equals one aircraft operation. As a result, half the number of operations represents the number of planes/ flights passing through the airport.</p> <p>(2) Rohnerville is significantly more accessible and less far inland than the other "inland" airports. It is also close to population centers, three miles southeast of Fortuna. Its greater proximity to the coast and the relatively low elevation mean that it is also more often affected by inclement weather.</p> <p>Sources: FAA National Flight Data Center, Effective Data February 21, 2002; Public Review Draft, Kneeland Airport Master Plan, February 15, 2002; Economic &amp; Planning Systems, Inc.</p>						

## **Kneeland Airport Use and Alternatives**

40. Precise estimates of the use of small airports are rarely available. Historical estimates adopted as official estimates by the California Division of Aeronautics in the early 1990's estimated annual activity at Kneeland Airport at 6,000 annual aircraft operations.<sup>12</sup> More recent estimates based on acoustical equipment reported in the 2002 Draft Airport Master Plan also estimate 6,000 annual aircraft operations, or a total of 3,000 annual flights passing through the airport.<sup>13</sup> This implies an average of over sixteen landings and take-offs, or eight flights, at Kneeland Airport every day of the year. Plane parking limits the airport to a maximum of six planes at any one time. Neither the FAA nor the County keeps comprehensive records of weather conditions around the different coastal airports. As a result, it is not possible to estimate the number of days when Kneeland and other non-coastal airports are required as refuges. Based on expectations of demographic and economic growth in the County, Shutt Moen Associates have projected a total of 7,000 annual aircraft operations, or 3,500 flights, in twenty years (see **Table 3**).<sup>14</sup>
41. Limited data is available on the purpose of flights at Kneeland Airport. The best indication of flight purpose is provided by the plane type, which, according to the 2002 Draft Master Plan, currently include 3,500 single engine fixed operations, 2,400 single-engine variable operations, 50 single-engine turboprop operations, and 50 light twin-engine operations.<sup>15</sup> The single-engine turboprop planes and the light twin-engine planes (currently 1.7 percent of flights) are small package cargo planes, according to Shutt Moen Associates, historically including FedEx and Ameriflight contracted operations.<sup>16</sup> Until recently, both these firms landed their small cargo planes at Kneeland Airport when inclement weather closed the coastal airports. Trucks drove up to Kneeland where the cargo was unloaded. Ameriflight still uses Kneeland Airport in this manner, though FedEx recently discontinued its use of the airport.<sup>17</sup> Other firms, such as Union Flights who deliver Airborne Express packages, do not use Kneeland Airport and instead land in Redding and wait for the coastal weather pattern to clear.<sup>18</sup> The majority of aircraft operations however, 5,900 operations (98.3 percent of annual operations) are associated with other flight types, including flight school training, recreational flights, and some business flights.

---

<sup>12</sup> Hodges & Shutt, Kneeland Airport Narrative Report, May 1993 (1993 Narrative Report). Conversation with Shutt Moen & Associates consultant, March 15, 2002.

<sup>13</sup> *Supra* (5).

<sup>14</sup> *Ibid.*

<sup>15</sup> *Ibid.*

<sup>16</sup> In-person conversations with Shutt Moen Associates and County Airport Manager, January 15, 2002.

<sup>17</sup> E-mail communication from FedEx Corporate Services, March 25, 2002.

<sup>18</sup> Telephone conversation with Big Foot Aviation, March 5, 2002.

<b>Table 3</b>										
<b>KNEELAND AIRPORT CURRENT AND PROJECTED ANNUAL OPERATIONS * DRAFT ECONOMIC ANALYSIS: KNEELAND PRAIRIE PENNY-CRESS</b>										
<b>Plane</b>	<b>Current Operations</b>		<b>Operations, Year 20</b>		<b>Average</b>	<b>Operations by Purpose (1)</b>				
	<b>#</b>	<b>%</b>	<b>#</b>	<b>%</b>	<b>Next 20 Years</b>	<b>Cargo</b>	<b>Educational</b>	<b>Recreation</b>	<b>Business</b>	<b>Total</b>
General Aviation										
Single-Engine Fixed	3,500	58.3%	4,100	58.6%	3,800	0	1,660	1,710	425	3,795
Single-Engine Variable	2,400	40.0%	2,700	38.6%	2,550	0	1,120	1,150	285	2,555
Subtotal	5,900	98.3%	6,800	97.1%	6,350	0	2,780	2,860	710	6,350
Cargo Carriers										
Single-Engine Turboprop	50	0.8%	100	1.4%	75	75	0	0	0	75
Light Twin-Engine	50	0.8%	100	1.4%	75	75	0	0	0	75
Subtotal	100	1.7%	200	2.9%	150	150	0	0	0	150
<b>Total</b>	<b>6,000</b>	<b>100%</b>	<b>7,000</b>	<b>100%</b>	<b>6,500</b>	<b>150</b>	<b>2,780</b>	<b>2,860</b>	<b>710</b>	<b>6,500</b>
<p>* Two operations represent one plane passing through Kneeland Airport, defined as one flight for the purposes of this analysis.</p> <p>(1) Assumes that all single engine turboprop and light twin engine flights are cargo flights, that 25 percent of remaining non-cargo flights are flight school related based on estimates from Northern Air Flight Training School and that the remaining aircraft operations break down as follows:</p> <p style="margin-left: 40px;">Education/ Practice: 25.0%</p> <p style="margin-left: 40px;">Refuge for Recreation Flights: 60.0%</p> <p style="margin-left: 40px;">Refuge for Business Flights: 15.0%</p> <p>The education category shown includes flight school training and practice flights.</p>										
Sources: Shutt Moen Associates; Humboldt County; Economic & Planning Systems, Inc.										

42. No precise data is available on the use of the airport by flight schools. Northern Air, based at Murray Field, is the only Humboldt County training school. Northern Air trains about 40 students each year, with average training taking six months.<sup>19</sup> These students all complete some practice and training at Kneeland. The average student trains at Kneeland about six times and takes off and lands an average of three times, for a total of six aircraft operations per training session. Training school-related flights are, thus, estimated to represent about 1,440 of the current annual aircraft operations, about 25 percent of non-cargo related flights. Trainee pilots are primarily trained at other locations, though Kneeland is considered to offer a useful training location for landing at short runway airports and for familiarizing pilots with the airport for use once trained.
43. The remaining annual 4,460 operations include pilots practicing landing at Kneeland, recreational fliers using Kneeland when inclement weather prevents landing at coastal airports, and business fliers using Kneeland due to inclement weather. No data is available on how these flights break out by purpose. For the purposes of this analysis, it is assumed that 25 percent of these operations are continuing education and practice flights, 60 percent are recreational flights using Kneeland as a refuge, and 15 percent are business flights using Kneeland as a refuge.<sup>20</sup> Applying these assumptions to the expected average annual total and small cargo aircraft operations at Kneeland Airport over the next twenty years of 6,500 and 150 respectively, implies an annual average of 2,780 education-related operations, 2,860 recreation refuge-related operations, and 710 business refuge-related operations. One flight includes two aircraft operations, making the total number of flights 3,250 flights.
44. Other airports, such as Garberville and Hoopa, also generally have clearer weather than the coastal airports and can serve a similar safety function to Kneeland Airport. Their greater distance from primary population centers and their more difficult approaches often make them less preferable as landing locations than Kneeland, despite the latter's shorter runway.<sup>21</sup>
45. The Kneeland Airport 1993 Narrative Report evaluated the airport.<sup>22</sup> The report drew two primary conclusions:
  - Improvements are required to keep the airport operational given the slope and soil type of the runway, the current erosion of the runway, and potential for earthquake damage.
  - Parking is too close to the centerline of the runway and would best be re-located further away.
46. Subsequently, a Kneeland Airport Preliminary Design Report of Airport Improvements (PDR) was completed in August 2001 by Shutt Moen Associates in association with SHN Consulting Engineers and Geologists (SHN).<sup>23</sup> The report describes the proposed airport improvement

---

<sup>19</sup> Telephone conversation with Northern Air, March 19, 2002.

<sup>20</sup> There is no formal data for this information. The estimates are based on impressions formed through conversations with Shutt Moen Associates consultants and other persons involved with the Humboldt County aviation industry and site visits during January, February, and March 2002.

<sup>21</sup> Telephone conversation with Shutt Moen Associates, March 15, 2002.

<sup>22</sup> *Supra* (4).

<sup>23</sup> Shutt Moen Associates/ SHN Consulting Engineers and Geologists (SHN), Kneeland Airport Preliminary Design Report of Airport Improvements (PDR), August 2001.

project. Certain project modifications were included to minimize the effects on the penny-cress, based on biological studies conducted in 1997. Since that time, new biological data has been obtained. The two primary components of the proposed airport improvement project are described below.

#### Re-located Parking Area

47. A parking area is proposed to the west of the runway, adjacent both to the runway and the State's helipad facility. This new location is primarily within the proposed critical habitat designation and is adjacent to occupied habitat.

#### Runway Stabilization and Restoration

48. According to the PDR, runway stabilization requires stabilization in four locations. Three of these areas are within the proposed critical habitat unit. One of the eastern stabilization areas (the east slide repair area) currently appears to lie directly adjacent to three smaller plant colonies. The improvements are considered necessary to stabilize the runway and to allow its continued operation into the future. Without the investment in runway stabilization, erosion of the runway is expected to lead to discontinued operations at some point in the next ten years.<sup>24</sup>
49. Stabilization efforts potentially entail excavating existing soils, grading portions of the surrounding landscape to facilitate load-bearing, installing supportive foundation structures (piles), and backfilling the excavated area with imported fill of appropriate density. In conjunction with the stabilization project the runway would be restored to its original length prior to erosion, a restoration of about 50 feet. Such efforts would require construction equipment and access by workers and supervisors to the area, as well as potential additional buffer areas. Construction efforts would be likely to generate dust, construction debris, and diesel exhaust. The proposed airport improvement project presented in the PDR includes efforts to avoid penny-cress habitat, including construction of a protective wall on the west of the runway and adjusted construction activity methods and areas.

#### **Potential Section 7 Effects**

50. No consultations have taken place with the Service concerning the proposed project, and no official airport improvement plans have been presented to the Service's Arcata Field Office (Field Office) for review. Initiation of airport improvement activities will require funding and approval from the FAA, providing a Federal nexus and requiring consultation under section 7. The Field Office has indicated that the consultation is likely to be formal. However, predicting the outcome of such a consultation is difficult, because no improvement plan has been officially proposed to the Service at this time. As a result, this analysis assumes that the PDR prepared by Shutt Moen Associates and SHN is very similar to the plan that the County will present to the Service during

---

<sup>24</sup> Supra (8).

the consultation process. Based on this plan, this analysis considers two possible outcomes. These scenarios form the basis for the estimate of economic impacts in **Chapter IV**.

- *Scenario 1: Formal Consultation, possibly resulting in minor project modifications.* The most likely outcome of the formal consultation is that the Service will either approve the airport proposal as presented by the County, or it may recommend minor project modifications. The precise nature of any recommended project modifications is difficult to predict in advance of the actual consultation. As a result, this analysis presents one possible estimate of project modification costs, based on the plan outlined in the PDR.
- *Scenario 2: Formal Consultation resulting in Jeopardy and/or Adverse Modification with no Alternatives.* A possible, but unlikely consultation outcome, is that the project would be found to jeopardize the species and/or adversely modify critical habitat, and the Service would be unable to identify reasonable and prudent alternatives. Such an outcome is extremely rare.<sup>25</sup> In most cases across the nation where jeopardy and/or adverse modification is identified, the local field office is able to identify reasonable and prudent alternatives. To be comprehensive, however, and consider all the possible outcomes, this analysis considers a finding that results in the eventual closure of Kneeland Airport.

51. SHN conducted biological surveys and assessments of the penny-cress in 1997, prior to either listing or critical habitat designation, indicating an awareness of the species and the likelihood that the FAA would have consulted with the Service absent the critical habitat designation. As a result, any economic costs and benefits associated with the Section 7 consultation are likely to be attributable co-extensively the listing.

#### STIGMA IMPACTS

52. Stigma impacts can derive from uncertainty concerning section 7 and the scope and impact of critical habitat designation. These impacts can reduce land values. Stigma effects are solely attributable to critical habitat designation.

---

<sup>25</sup> For example, in the 62 biological opinions regarding other species issued by the Service's Arcata field office, none have resulted in a jeopardy finding. (E-mail communication with Biologist, Arcata Field Office, U.S. Fish and Wildlife Service, April 16, 2002.)

## **IV. ESTIMATED SECTION 7 COSTS**

---

53. This chapter estimates the economic costs associated with the potential effects of section 7 on land use activities, as described in **Chapter III**, and the potential stigma effects of critical habitat designation on private land.

## **KNEELAND AIRPORT EFFECTS**

54. Kneeland Airport, as discussed in **Chapter III**, is not a destination for flights. It either acts as a location for flight training or as a refuge airport or cargo unloading airport when other airports are closed due to inclement weather. This section estimates the costs associated with the consultation and two possible outcomes of the consultation process, Scenarios 1 and 2, described in **Chapter III**.
55. Implementation of the airport improvement project as set out in the PDR is expected to ensure the continued use, and possibly a slightly expanded use, of Kneeland Airport over the next twenty years. The closure of the airport would result in the re-distribution and/or discontinuation of flights using Kneeland Airport. Economic costs associated with Section 7 consultation include additional capital cost investment requirements and/or the loss of air travel functions. Air travel effects were based on the availability and current use of alternative airports during inclement weather, the availability of other transportation modes, estimates of potential delay times, and other, non-section 7 hurdles to the implementation of the airport improvement project. Economic costs were considered over a twenty-year period. Economic cost estimates associated with the airport are described below.

## LIKELIHOOD OF APPROVAL

56. Over the last nine years, a number of studies have considered the condition of Kneeland Airport. Most recently, the PDR was completed in August 2001 by Shutt Moen Associates in association with SHN. This report recommended an investment of \$2.05 million in improvements, including land acquisition, stabilizing the existing runway, restoring the runway to its original length, turnaround construction, and constructing an expanded parking area further removed from the runway.<sup>26</sup> There are a number of steps that are still to be completed before the airport improvement plan could be implemented:
- **County Approval.** The County Board of Supervisors would need to approve the project for it to go ahead.

---

<sup>26</sup> Supra (15).

- **Environmental Review.** A number of environmental review procedures would be required, including those required by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). After consideration of information provided during these reviews, the FAA could decide not to permit or fund the project.
  - **Funding Availability.** Funding for improvements has not yet been obtained. The FAA, the primary source of funding, would need to approve the plans to improve this airport.
  - **Land Purchase.** The County needs to enter into an agreement with a private landowner to purchase portions of the land required for construction activities and on-going maintenance. Permission has not yet been obtained.
57. For purposes of attributing an economic cost to Section 7, an airport improvement probability was assigned to the project of 75 percent. This probability was based on the number of steps still to be completed, the length of time over which airport improvements have been considered, and the suggested importance of the airport indicated by County and FAA staff. It represents the likelihood that the airport improvement plan would be completed in the next ten years in the absence of section 7. Effects associated with section 7 can only occur if the project first passes these other hurdles. If, as a result of these steps, the County or the FAA decides not to continue with the airport project, then the costs associated with section 7 will be zero.

## SCENARIO 1: FORMAL CONSULTATION WITH MINOR PROJECT MODIFICATIONS

### **Consultation Cost**

58. The Field Office has indicated that a formal consultation is likely to be required for the airport improvement project. Consultation costs include the cost of time spent by the Service preparing a biological opinion and meeting with the County airport team and the FAA. Costs to the FAA (the action agency) and the County (the third party) will also include meetings and preparation time. **Table 4** presents estimates of costs to the Service of conducting the formal consultation. These costs are based on time estimates and hourly rates provided by the Field Office.<sup>27</sup> The total cost to the Service is estimated at \$6,000, including \$2,000 on the biological opinion and \$4,000 on administration and meetings. Administrative and meeting costs incurred by the FAA are estimated at \$5,200. Administrative and meeting costs incurred by the County are estimated at \$3,500. The County also incurs costs of \$5,600 for the completion of a biological assessment, for total costs of \$9,100. These estimates represent average costs to action agencies and third parties derived from prior consultations at the other California field offices.<sup>28</sup> Total consultation costs, all parties included, are estimated at \$20,300.

---

<sup>27</sup> Telephone conversation with Field Office, January 25, 2002.

<sup>28</sup> Consultation cost model developed by IEc, dated March, 2002. IEc's model relies on data from the Federal Government General Schedule Rates, Office of Personnel Management, 2002, a review of consultation records from several field offices across the country, and communication with Biologists in the service.

**Table 4**

**SERVICE FORMAL CONSULTATION COSTS FOR AIRPORT IMPROVEMENT PROJECT  
 DRAFT ECONOMIC ANALYSIS: KNEELAND PRAIRIE PENNY-CRESS**

<b>Service Staff Type</b>	<b>Hours (1) Biological Opinion</b>	<b>Administration/ Meetings</b>	<b>Total Hours</b>	<b>Cost/ Hour(2)</b>	<b>Cost Biological Opinion</b>	<b>Administration /Meetings</b>	<b>Total Cost</b>
GS-14: Senior Staff	4	8	12	\$55	\$220	\$440	\$660
GS-12: Staff Biologist	53	107	160	\$33	\$1,760	\$3,520	\$5,280
<b>Total</b>	<b>57</b>	<b>115</b>	<b>172</b>		<b>\$1,980</b>	<b>\$3,960</b>	<b>\$5,940</b>

(1) Assumes that one-third of staff time focused on preparation of the biological opinion, and the remainder on administrative tasks and meetings.  
 (2) Provided by Field Office.

Sources: Service Arcata Field Office; Economic & Planning Systems, Inc.

59. Project delays resulting from section 7 consultations can represent an additional economic cost. The 1999 Annual Station Report from the Field Office states that the average time to complete a formal consultation is approximately 65 days after receipt of an agreed upon biological assessment.<sup>29</sup> In the context of the seven year planning process since the preparation of the 1993 Narrative Report, a project delay of 65 days is relatively short (less than 5 percent of time to date), so no costs associated with consultation delays were estimated.

### **Project Modification/ Effects Cost**

60. Under this scenario, the Service might recommend project modifications during the consultation process. This analysis assumes that these project modifications might include: (1) an increased distance between the proposed east slide repair construction area and the PCEs than is currently proposed in the PDR; and (2) an increased distance between the parking area and the west side occupied habitat as well as an access route to the parking area that avoids the critical habitat area.<sup>30</sup>
61. The airport improvement project set out in the PDR recommended improvements costing a total of \$2.05 million. The PDR recognized the presence of the penny-cress in its Appendix A: “Biological Surveys and Assessment of the Kneeland Pennycress,” prepared by SHN.<sup>31</sup> According to SHN, the project laid out in this report presumed generalized efforts to avoid disturbing the suitable habitat for penny-cress (as it was understood in 1997) and to cushion habitat from construction activities. The proportion of these costs attributable to penny-cress related issues was never formally broken out and a precise estimate would require additional technical studies. Based on a review of the PDR and conversations with consultants at SHN, a 2.5 percent share of overall project cost, or approximately \$51,000, is likely a conservatively high estimate of internalized project costs associated with penny-cress avoidance.<sup>32</sup>
62. Additional project modifications will be required under this scenario. The additional project modifications costs are speculative. Based on conversations with Shutt Moen Associates and the County Airport Manager, the parking area could be shifted a little further north at minimal additional cost, and access routes could likely be obtained through the already developed CDF property.<sup>33</sup> The cost of shifting the east slide construction area further away from the large area of suitable habitat on the east side of the runway is also uncertain. No formal mapping overlays between the habitat areas and the proposed construction areas have been conducted. A review of the habitat areas shown in the Field Office penny-cress map and the construction areas indicated in the PDR suggests that the east slide construction area as currently configured lies within an area containing PCEs and close to occupied habitat.

---

<sup>29</sup> Arcata Field Office, Annual Station Report, 1999.

<sup>30</sup> Based on in-person and telephone conversations with Field Office, January 15, January 25, and March 15, 2002, and a telephone conversation with SHN, March 15, 2002, concerning the type of project modifications that would not prevent project implementation.

<sup>31</sup> Supra (15).

<sup>32</sup> Conversation with SHN consultant, March 15, 2002.

<sup>33</sup> Supra (8).

63. The cost currently associated with the east slide construction repair is estimated at about \$100,000 in the PDR. An accurate estimate of the additional cost associated with shifting the construction area further away from occupied habitat would require a separate technical study. Based on conversations with SHN consultants, the additional cost of shifting the construction area a small distance from the suitable habitat area is unlikely to be greater than \$100,000.<sup>34</sup> As a result, total costs associated with penny-cress avoidance under this scenario are estimated at approximately \$151,000, including \$100,000 in additional east slide area costs and \$51,000 in already internalized project modification costs. Applying the 75 percent probability factor results in a section 7 related economic cost of \$113,000. As discussed in **Chapter III**, these costs are attributable co-extensively to the listing of the penny-cress.

## SCENARIO 2: JEOPARDY/ ADVERSE MODIFICATION – NO ALTERNATIVES

### **Consultation Cost**

64. A formal consultation will also be required under Scenario 2, and costs are expected to be the same as for Scenario 1, with \$6,000 to the Service, \$5,200 to the FAA, and \$9,100 to the County for a total of \$20,300. Similar to Scenario 1, no cost effect is expected to be associated with the time-component of the consultation.

### **Project Modification/ Effects Costs**

65. Although unlikely, the consultation might result in a finding of jeopardy and/or adverse modification, and the Service might be unable to identify any reasonable and prudent alternatives. In this case, the airport improvement plan could not be implemented. Under this scenario, there are two possible outcomes:
- *Outcome I:* Eventual airport closure with no replacement airport.
  - *Outcome II:* Eventual airport closure followed by the construction of a similar high elevation, ridgetop airport.
66. The public safety/ refuge role of the airport implies that construction of a replacement airport may be preferable to no replacement airport if Kneeland Airport closes. However, replacement of the airport faces two significant challenges, finding an appropriate alternate location and competing for the significant funding that would be required from the FAA. As a result, this analysis considers both possibilities; replacement and no replacement. If the airport is replaced, this analysis assumes that the County will go without a high elevation airport for a certain period of time while the airport is planned and constructed. Assumptions concerning airport closure and construction timing used in the analysis of the two Scenario 2 outcomes include the following:

---

<sup>34</sup> Supra (23).

- *Airport closure in four years* - The County Airport Manager and Shutt Moen Associates have indicated that the Kneeland airport is likely to close within ten years if the slide area improvements are not completed.<sup>35</sup> A single occurrence such as an earthquake, additional soil erosion over time, or heightened safety concerns could be the reason for the closure. For the purposes of this analysis, it is conservatively assumed that, in the absence of implementation of the proposed airport improvement project, the airport will close after four years due to soil erosion and associated runway degradation.
- *Potential replacement airport within ten years* - Shutt Moen Associates have indicated that construction of a replacement airport at similar elevations in Humboldt County is likely to take five to eight years from project conception, based on prior experience with similar airport construction.<sup>36</sup> For the purposes of this analysis, it is assumed that the likelihood of airport closure is recognized within two years and that the project takes seven years to complete. As a result, the replacement airport would be available after nine years.
- *Annual average of 6,500 aircraft operations, or 3,250 flights, at Kneeland Airport over the next twenty years if the airport improvement project is implemented* – These estimates are based on Shutt Moen Associates current and projected aviation activity estimates described in **Chapter III**. Very limited data is available on the type of aircraft operations passing through Kneeland Airport. Estimates of annual aircraft operations developed in **Chapter III**, imply the following annual flight estimates (two aircraft operations represent one flight): 75 cargo-related flights; 1,390 education-related flights; 1,430 recreation-related flights; and, 355 business-related flights.

#### SCENARIO 2, OUTCOME I: AIRPORT CLOSURE – NO REPLACEMENT

67. This section estimates the economic cost associated with airport closure without replacement. The following sections estimate the annual economic costs, in real dollars, associated with loss of or re-direction of flights as a result of the closure of Kneeland Airport. These annual estimates are then discounted over twenty years to determine the net present value of the economic costs.<sup>37</sup> Under this scenario, economic costs will occur after airport closure from year five onwards through the end of the study period in year twenty. In reality, if the airport is not replaced, economic losses will continue indefinitely into the future. In present value terms, however, the losses will be much reduced beyond year twenty. Other effects of airport closure are described qualitatively.

---

<sup>35</sup> Supra (8).

<sup>36</sup> Telephone conversation with Shutt Moen Associates March 20, 2002.

<sup>37</sup> The U.S. Office of Management and Budget recommends using a discount rate of seven percent. In addition, it recommends testing the sensitivity of this rate using a social rate of time preference equal to the government borrowing rate. The guidance suggests that analysts often use the average rate on long-term Treasury bonds, which recently have been equal to approximately three percent (U.S. Office of Management and Budget, "Guidelines to Standardize Measure of Costs and Benefits and the Format of Accounting Statements," in *Report to Congress on the Costs and Benefits of Federal Regulations*, March 22, 2000).

## Air Cargo Flights

### Air Travel Effects

68. Historically, some of the small air cargo carriers, including Federal Express (FedEx) and Ameriflight, have landed planes at Kneeland Airport during inclement weather, while others, Union Flights, have chosen to land at Redding Airport.<sup>38</sup> FedEx recently decided to discontinue landing at Kneeland Airport.<sup>39</sup> Most of these flights originate in Sacramento. Cargo flights landing at Kneeland generally send up trucks to pick up cargo.<sup>40</sup> Flights diverting to Redding wait for weather patterns to improve.<sup>41</sup> The U.S. Postal Service trucks all its cargo into the County, including its express delivery service packages.<sup>42</sup>
69. The closure of Kneeland Airport is not expected to reduce the quantity of cargo entering the County, but will rather change travel patterns. It is assumed that there is no change in the number of flights, but, rather, that all air cargo-related flights divert to Redding during inclement weather. The loss of Kneeland as an unloading option may increase cargo delay times. At present, Union Flights, which diverts to Redding Airport during inclement weather, will, on occasion, deliver packages at most two hours after scheduled arrival, according to company representatives.<sup>43</sup> For the purposes of this analysis, it is assumed that a two hour delay for 50 percent of air cargo previously passing through Kneeland Airport represents a conservatively high estimate of additional delivery delay associated with airport closure.

### Economic Cost Effects

70. The economic loss associated with delays in small package delivery can be estimated based on consumers' willingness to pay for faster delivery times. The annual economic loss, and associated loss over the next ten years, was derived based on the following assumptions:
- *Delayed Flights.* Of the 75 cargo-related flights, it is conservatively assumed that cargo in 50 percent of diverted planes will arrive on time, and 50 percent will arrive two hours late.
  - *Plane Capacity.* Most air cargo delivery planes using Kneeland as a back-up are single-engine turboprop or light twin-engine planes and generally haul between 1,700 and 2,900 pounds (lbs). It is assumed that the average plane hauls 2,300 lbs, including 200 one-lb letters, 190 packages at an average of 8.4 lbs, and 10 packages at an average of 50 lbs. These estimates are based on discussions with cargo plane service operators.

---

<sup>38</sup> Supra (8).

<sup>39</sup> Supra (9).

<sup>40</sup> Supra (8).

<sup>41</sup> Supra (10).

<sup>42</sup> Supra (8).

<sup>43</sup> Supra (8).

- *Differential Values.* A comparison between delivery rates for FedEx priority overnight service, intended for 10:30 am arrival, and standard overnight service, intended for 4:30 pm arrival, provides a proxy for the economic loss due to a plane delay of six hours. Packages originate from a number of locations so a composite average of locations throughout the United States was applied to these package types. The average economic value loss for the assumed package distribution described above is estimated to be about \$1,650 per plane for a six hour delay, equivalent to \$275 per hour, and \$550 for a two hour delay (see **Table 5**).

71. Based on these assumptions, the average annual lost economic value associated with delays in cargo flights is about \$21,000 from year 5 onwards in real 2002 dollars. Considered over a twenty year period and discounted into net present value dollars, the economic loss is between \$149,000 and \$230,000, applying discount rates of seven percent and three percent, respectively. Applying the 75 percent probability factor results in a study period loss of between \$112,000 and \$173,000.

## **General Aviation - Business Flights**

### Air Travel Effects

72. As described above, it is assumed that 355 of the flights landing at Kneeland Airport are business flights. Most of these flights would likely divert to another airport during inclement weather.<sup>44</sup> This analysis is conservative in assuming that the closure of Kneeland Airport would actually reduce the number of annual business flights by 25 percent of the current amount, 89 flights. The other 75 percent, 266 flights, are expected to land at Gabberville, Hoopa, or Redding, during inclement weather, and fly into the County when the weather clears. These diversions are conservatively estimated to add about one and one half hours to the average flight time.<sup>45</sup>

---

<sup>44</sup> Based on availability of other airports in the County that could serve as a refuge when inclement weather prevents landing at coastal airports.

<sup>45</sup> Based on locations and approaches.

<b>Table 5</b>											
<b>AVERAGE SHIPPING RATES AND COSTS TO EUREKA, CALIFORNIA DRAFT ECONOMIC ANALYSIS: KNEELAND PRAIRIE PENNY-CRESS</b>											
Shipping Item Type	Service	Weight (lbs)	Number	Origin							
				Sacramento		Los Angeles		Chicago		New York City	
				Rate	Total Cost	Rate	Total Cost	Rate	Total Cost	Rate	Total Cost
Express Letter	Std. Overnight	1	200	\$15.50	\$3,100	\$18.50	\$3,700	\$22.75	\$4,550	\$22.75	\$4,550
	Priority Overnight			\$17.75	\$3,550	\$21.00	\$4,200	\$25.75	\$5,150	\$25.75	\$5,150
Package	Std. Overnight	8.4	190	\$23.50	\$4,465	\$35.50	\$6,745	\$43.00	\$8,170	\$43.00	\$8,170
	Priority Overnight			\$27.25	\$5,178	\$40.00	\$7,600	\$49.50	\$9,405	\$49.50	\$9,405
Package	Std. Overnight	8.4	10	\$60.75	\$608	\$102.50	\$1,025	\$126.50	\$1,265	\$126.50	\$1,265
	Priority Overnight			\$69.00	\$690	\$114.50	\$1,145	\$137.75	\$1,378	\$137.75	\$1,378
<b>Cost Totals Per Airplane:</b>											
Std Overnight:				\$8,173		\$11,470		\$13,985		\$13,985	
Priority Overnight:				\$9,418		\$12,945		\$15,933		\$15,933	
Incremental Cost of Express Delivery:				\$1,245		\$1,475		\$1,948		\$1,948	
<b>Average Incremental Cost of Express Delivery per Airplane:</b>										<b>\$1,654</b>	
<b>Notes:</b>											
Rates for packages assumed packaging was done by the sender. Rates assume delivery to a pickup location in Eureka, and do not include door-to-door delivery charges. Shipping quantities per airplane were based on the following information provided by a private carrier at Murray Field:											
400 Packages (including letters), weighing 2300 lbs.											
Individual packages weigh between 1 and 50 lbs											
200 lbs of Letters											
Each FedEx letter weighs 1.0 lb.											
10 packages weigh 50 lbs											
The remaining 190 packages weigh an average of 8.4 lbs											
Source: Federal Express (www.fedex.com, 2/04/02); Economic & Planning Systems, Inc.											

### Economic Cost Effects

73. The economic loss associated with the greater delays for diverted flights and the reduction in the number of business flights is estimated as follows:
- *Lost Time Value.* A total of about 399 hours are expected to be lost annually due to flight delays, equivalent to about \$80,000 each year in real 2002 dollars based on an assumed executive level billing rate of \$200 per hour.
  - *Lost Flight Value.* A total of about \$51,000 in flight value in real 2002 dollars is expected to be lost annually based on the number of flights presumed lost, 89 flights, and an estimated value per business flight of \$575.<sup>46</sup> This cost represents a proxy for the market value of a business flight.
74. Based on these estimates, a total of about \$131,000 in real 2002 dollars would be lost annually from years five onward. Considered over the study period and discounted into net present value dollars, the economic loss is between \$943,000 and \$1.46 million, applying discount rates of seven percent and three percent, respectively. Applying the 75 percent probability factor results in a study period loss of between \$708,000 and \$1.10 million.

## **General Aviation - Recreational Flights**

### Air Travel Effects

75. As described above, it is assumed that 1,430 of the flights landing at Kneeland Airport are recreation flights. Most of these flights will likely divert to other airports off the coast, such as Gabberville or Hoopa. Some pilots and associated flights might be discontinued due to the more difficult approaches and remote locations at these alternative airports. For the purposes of this analysis, it is conservatively assumed that about 25 percent of these flights, 358 flights, are discontinued.

### Economic Cost Effects

76. The reduction in flights and possibly pilots will result in a loss in aviation-related user utility of about \$450 per flight. This user utility proxy is based on the average cost of renting an airplane for recreational use, \$150 per hour of plane operation, and an average duration of three hours of flying.<sup>47</sup> This represents a total loss in user utility of about \$161,000 annually in real 2002 dollars from year 5 onwards. Considered over the study period and discounted into net present value dollars, the economic loss is between \$1.16 million and \$1.80 million, applying discount rates of

---

<sup>46</sup> This value represents the average cost of a four or five day advance flight, returning the following day, on United Airlines into Arcata/Eureka airport from a cross-section of West Coast locations, as reported on March 21, 2002 at [www.ual.com](http://www.ual.com).

<sup>47</sup> These estimates are based on the rates and consumer use patterns of recreational aviation rental businesses in Northern California.

seven percent and three percent, respectively. Applying the 75 percent probability that closure will occur results in a study period loss of between \$870,000 and \$1.35 million. This represents a conservatively high estimate as these flights would likely be substituted with another activity that would generate some user utility. No economic loss is attributed to recreation-related flights that divert to other airports during inclement weather.

## **General Aviation - Educational Flights**

### Air Travel Effects

77. An estimated 1,390 annual flights at Kneeland Airport are associated with airport use by flight schools and pilots practicing short runway landings. If Kneeland Airport closes, it is expected that these flights and training functions could be re-distributed to one or more of the other County airports.

### Economic Cost Effects

78. The expected re-distribution of educational flights to other airports implies that the economic loss is likely to be minimal.

## **Total Quantifiable Economic Cost Effects**

79. The overall economic loss over the study period associated with these quantifiable effects, in discounted dollar terms, is estimated to range from \$1.69 million to \$2.61 million, applying discount rates of seven and three percent, respectively (see **Table 6**). Given the “without section 7” economic cost of the airport improvement plan of \$2.025 million, or \$1.52 million, when adjusted for the probability of airport project go-ahead, the additional economic loss associated with section 7 is between about \$169,000 and \$1.09 million. As described in **Chapter III**, these costs are attributable co-extensively to the listing of the penny-cress.

## **Additional Effects**

80. Additional effects of airport closure are broader effects on the regional economy generally not fully captured above. They are often more difficult to quantify accurately. Potential, additional effects are discussed below.

### Public Safety Function

81. Kneeland Airport plays an important public safety function in respect to small plane aviation in the County. The loss of this function may reduce the number of flights and pilots and/or increase plane equipment costs. The analysis above captured some of the lost economic value of this public safety function by assuming an associated reduction in business and recreational flights. Other effects of this lost function lie outside of the scope of an economic impact analysis.

Table 6

**ECONOMIC COST OF AIRPORT CLOSURE WITHOUT REPLACEMENT (20 year total)  
 DRAFT ECONOMIC ANALYSIS: KNEELAND PRAIRIE PENNY-CRESS**

Flight Type	Average Annual Flights (20 year total)	Affected Flights	Economic Cost Per Flight Diverted or Lost (real 2002\$\$)	Average Annual Economic Cost (real 2002\$\$)	Total Economic Cost: twenty year total (real 2002\$\$)	Net Present Value of Economic Cost over twenty years		Net Present Value of Economic Cost 75 Percent Probability	
						7 Percent	3 Percent	7 Percent	3 Percent
Cargo Delivery	75	38	\$550	\$20,625	\$330,000	\$148,640	\$230,183	\$111,480	\$172,637
Educational Flights	1,390	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Recreational Flights	1,430	358	\$450	\$160,875	\$2,574,000	\$1,159,394	\$1,795,426	\$869,546	\$1,346,569
Business Flights									
Delayed	--	266	\$300	\$79,875	\$1,278,000	\$575,643	\$891,435	\$431,733	\$668,576
Lost	--	89	\$575	\$51,031	\$816,500	\$367,772	\$569,528	\$275,829	\$427,146
Subtotal	355	355	--	\$130,906	\$2,094,500	\$943,416	\$1,460,963	\$707,562	\$1,095,722
<b>Total</b>	<b>3,250</b>	<b>--</b>	<b>--</b>	<b>\$312,000</b>	<b>\$4,999,000</b>	<b>\$2,251,000</b>	<b>\$3,487,000</b>	<b>\$1,689,000</b>	<b>\$2,615,000</b>

Source: Economic & Planning Systems, Inc.

### Regional Economic Development

82. As discussed in Chapter II, the functioning of any regional economy depends in part on the movement of persons and goods, two key factors of economic production, which are, in turn, dependent on the transportation system component of public infrastructure. Significant reductions in transportation system infrastructure are likely to reduce mobility and are likely to have adverse effect on regional economic vitality due to difficulties with business attraction and retention.
83. The closure of Kneeland Airport, however, represents a relatively small reduction in the transportation infrastructure of Humboldt County. The relatively limited number of package delivery delays, other flight delays, and required mode shifts are not expected to affect County mobility and economic development significantly.

### Community Development

84. Airports represent vehicles for community development in many regions throughout the United States. The limited size and use options of the Kneeland Airport limit its current role as a vehicle for community development in the nearby community of Kneeland. While it is expected that the use of the airport would increase and flight school operations would continue if the airport were not closed, the potential for the airport to play a significant role in community development at Kneeland is relatively limited.

### SCENARIO 2, OUTCOME II: AIRPORT CLOSURE – REPLACEMENT

85. This section estimates the economic cost associated with airport closure with replacement. Based on the assumptions described above, it is expected that the Kneeland Airport will close in five years and the replacement airport will open in ten years. As a result, the economic loss under this scenario will include four years of losses associated with no airport operation in addition to the replacement cost of the airport. After airport replacement, no continuing economic losses will be incurred as all airport functions will be returned. These economic losses are estimated below.
- **Airport Construction Costs.** The cost of constructing a new airport, with a similar level of service as Kneeland, in constant 2002 dollars, including the soft costs of site selection, environmental review, and design, and the hard costs of infrastructure and airport construction, is expected to be in the \$5 to \$10 million range according to Shutt Moen Associates.<sup>48</sup> Assuming a \$7.5 million total project cost spread over seven years from year 3 through year 9 results in a discounted replacement airport cost of between \$5.0 and \$6.3 million, applying discount rates of seven and three percent, respectively. Applying the 75 percent probability that the airport project will go-ahead results in a study period loss of between \$3.78 million and \$4.72 million.

---

<sup>48</sup> Supra (27).

- **Lag Time Loss.** The unavailability of the airport between year 5 and year 10 results in annual losses of the magnitudes discussed under Outcome 1, above. As shown in **Table 6**, the average annual loss in real 2002 dollars is about \$312,000. When considered for this period and discounted, the net present value of the economic loss is between \$977,000 and \$1.27 million. Applying the 75 percent probability that the airport project will go-ahead results in a study period loss of between \$733,000 and \$953,000.
86. The overall economic loss over the study period associated with airport closure and replacement, in discounted dollar terms, is estimated to range from \$4.52 million to \$5.67 million, applying discount rates of seven and three percent, respectively. Given the “without section 7” economic cost of the airport improvement plan of \$2.025 million, or \$1.52 million, when adjusted for the probability of project implementation, the economic loss associated with section 7 is between about \$3.0 and \$4.2 million. As described in **Chapter III**, these costs are attributable co-extensively to the listing.

## **STIGMA EFFECTS**

87. Stigma impacts can derive from uncertainty concerning section 7 and the scope and impact of critical habitat designation. Stigma associated with the proposed designation may reduce aggregate willingness-to-pay for the land, which, in turn, results in a reduced land value. These impacts are generally difficult to quantify. Stigma effects are solely attributable to critical habitat designation.

## **V. SMALL BUSINESS REGULATORY ENFORCEMENT ACT**

---

88. Under the Regulatory Flexibility Act (as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and 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).<sup>49</sup> However, no 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.<sup>50</sup> SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities. Accordingly, the following represents a screening level analysis of the potential effects of critical habitat designation on small entities to assist the Secretary in making this certification.
89. Entities potentially affected by this rulemaking include Humboldt County, which owns the airport, and private landowners. SBREFA defines a "small governmental jurisdiction" as "governments of cities, counties...with a population of less than fifty thousand."<sup>51</sup> Because Humboldt County has a population exceeding 50,000, the county government is not considered a small entity. In addition, private landowners are generally not business entities, and therefore are not included in this analysis. Because no small entities as defined by SBREFA will potentially be affected by the designation of critical habitat, additional analysis under SBREFA is unnecessary.

---

<sup>49</sup> 5 U.S.C. 601 et. seq.

<sup>50</sup> Thus, for a regulatory flexibility analysis to be required, impacts must exceed a threshold for "significant impact" **and** a threshold for a "substantial number of small entities." See 5 U.S.C. 605 (b).

<sup>51</sup> U.S.C. § 601

## **VI. BENEFITS OF CRITICAL HABITAT DESIGNATION**

---

90. To determine the benefits of critical habitat designation for the penny-cress, this report considers those categories of benefit that will be enhanced as a result of the listing of the species and the proposed critical habitat designation.
91. The primary goal of listing a species under the Act is to preserve the listed species and the ecosystems upon which they depend. However, various economic benefits, measured in terms of regional economic performance and enhanced national social welfare, result from species preservation as well. Regional economic benefits can be expressed in terms of jobs created, regional sector revenues, and overall economic activity. National social welfare values reflect both use and non-use (i.e., existence) values, and can reflect various categories of value. For example, use values might include the recreational use of habitat area preserved as a result of the penny-cress. Existence values are not derived from direct use of the species, but instead reflect the satisfaction and utility people derive from the knowledge that a species exists. In addition, actions to protect the penny-cress may also benefit other organisms.
92. The benefits identified above arise primarily from the protection afforded to the penny-cress under the Federal listing. Critical habitat designation may provide some additional benefits beyond the listing benefits. Critical habitat designation provides some educational benefit by increasing awareness of the extent of penny-cress habitat. Critical habitat also provides a legal definition of the extent of penny-cress habitat, which reduces the amount of uncertainty Federal agencies face when determining if a section 7 consultation is necessary for an activity with a Federal nexus.
93. The quantification of total economic benefits attributable to the designation of critical habitat is, at best, difficult. To the extent that future consultations are expected to be associated with the listing of the species, rather than the critical habitat designation, designation of critical habitat does not increase the probability of recovery for the species. In that case, the additional benefits of designating critical habitat for the penny-cress would be limited to the educational benefits, increased support for existing conservation efforts, and reduced uncertainty regarding the extent of penny-cress habitat.