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Economic Analysis of Critical Habitat Designation for Salt Creek Tiger Beetle

Prepared for:
U.S. Fish and Wildlife Service
Arlington, Virginia

Prepared by:
Northwest Economic Associates
A Division of ENTRIX, Inc.
Vancouver, Washington

July 17, 2007

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July 17, 2007

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The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the Federally-listed Salt Creek tiger beetle (*Cicindela nevadica lincolniana*, hereafter referred to as Beetle or species).

The Service has proposed 1,778 acres in Lancaster and Saunders counties for the Beetle. Potential critical habitat is divided into four units. Figure ES-1 provides a map of the areas. The units are comprised of a mix of state, city, non-governmental organization (NGO), and private lands. Of the critical habitat acres proposed for designation, about 49 percent belong to private landowners, over 34 percent are state lands, almost nine percent are owned by an NGO, and the remaining approximately eight percent are city lands.

Figure ES-2 summarizes key findings of the economic analysis. Results are presented in greater detail later in this summary.

ES.1 RESULTS OF THE ANALYSIS

Potential impacts are separated according to activity into six impact categories: impacts to land development activities; impacts associated with the Beetle Habitat Conservation Plan (HCP); impacts of conservation of public and non-profit lands; impacts related to agricultural activities; impacts to transportation and public works operations; and administrative costs related to the Section 7 consultation process. Table ES-1 provides detailed pre- and post-designation impact information for all activities. Pre- and post-designation impacts are provided in undiscounted 2007 dollars. Post-designation impacts are also provided in present value and annualized terms using three and seven percent discount rates.

Figure ES-3 illustrates the distribution of expected future conservation impacts across these activities, presenting relative impacts by affected activity using the upper-bound impact estimates. As shown, impacts related to land development account for approximately 52 to 64 percent of anticipated impacts, followed by conservation costs on public and non-profit lands (approximately 24 to 33 percent), impacts stemming from the development of the Beetle HCP (approximately seven to nine percent), and impacts associated with transportation and public works operations (approximately three to five percent). About one percent of the expected impacts are agriculture-related, while less than one percent is attributed to administrative costs; agriculture and administrative impacts together account for about 1.5 percent of total impacts.

Table E-1, located at the beginning of Appendix E, provides detailed total pre- and post-designation impact information on a unit-by-unit basis, while Tables E-2 to E-7 in the appendix present the same information for each activity. Maps showing the land ownership within the units are provided in Appendix C of this report, while those illustrating land uses are given in Appendix D.

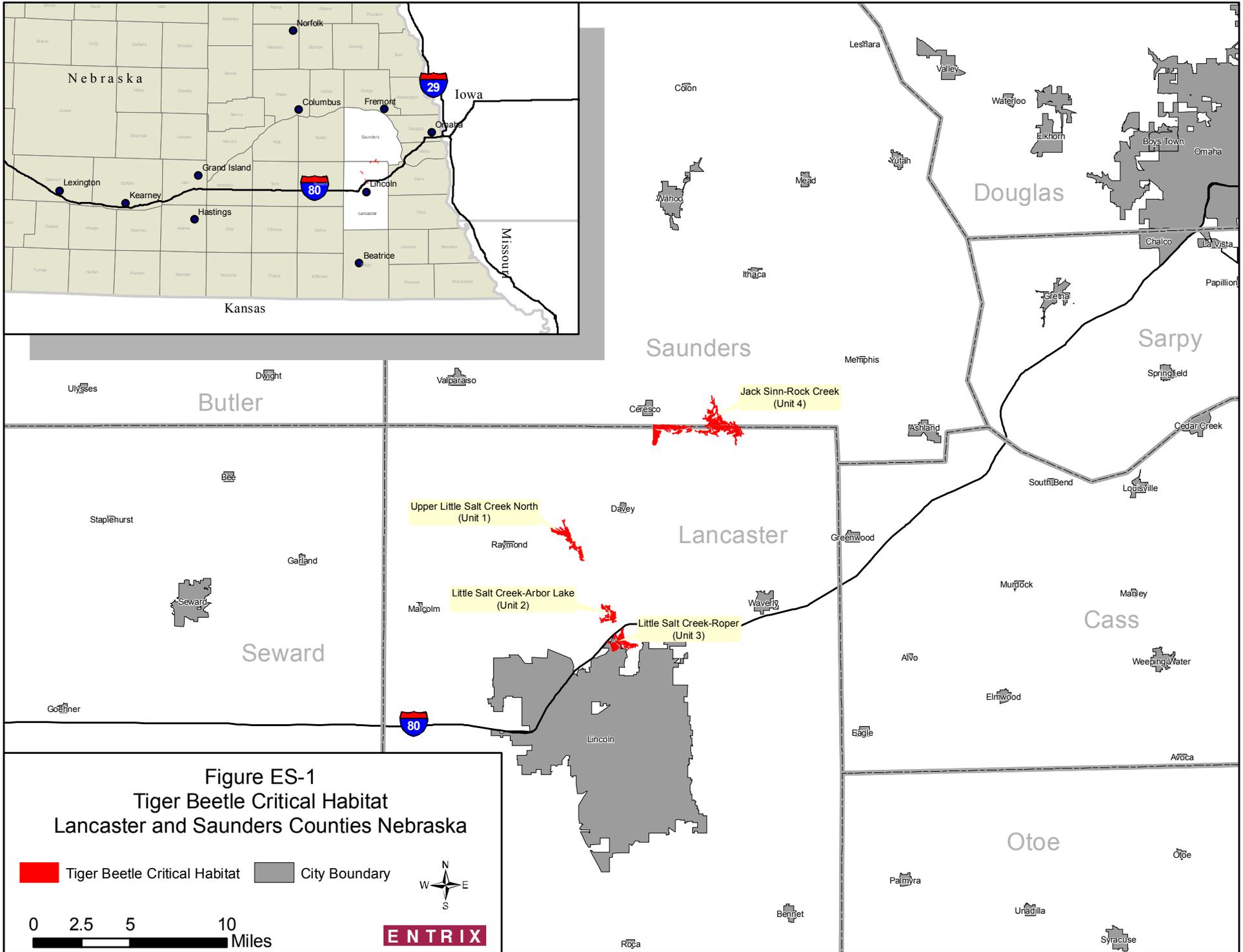


Figure ES-1
 Tiger Beetle Critical Habitat
 Lancaster and Saunders Counties Nebraska

Tiger Beetle Critical Habitat
 City Boundary

0
 2.5
 5
 10 Miles

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Figure ES-2 Key Findings¹

Total impacts: Pre-designation (2005-2007) impacts associated with species conservation activities are estimated at \$2.6 million in 2007 dollars. Potential post-designation (2008-2027) impacts are estimated to range between \$21.4 and \$25.5 million in undiscounted dollars. In discounted terms, potential economic impacts are estimated to be \$19.9 to \$22.9 million (using a three percent discount rate) or \$18.5 to \$20.6 million (using a seven percent discount rate). In annualized terms, potential impacts are expected to range from \$1.3 to \$1.5 million (annualized at three percent) and \$1.7 to \$1.9 million (annualized at seven percent).

Activities most impacted: Impacts associated with development and public and NGO conservation activities comprise approximately 87 percent of the total quantified impacts in the areas proposed for designation. In summary:

- ◆ **Development:** Development-related impacts account for approximately 58 percent of forecast impacts. Future impacts are estimated at \$13.3 million. The impacts primarily consist of likely decreases in land value resulting from the restrictions on development, especially in the vicinity of the City of Lincoln.
- ◆ **Public and NGO Conservation Activities:** Impacts associated with conservation activities account for an additional 29 percent of forecast impacts. Future impacts are estimated to range between \$3.8 and \$6.6 million. The estimates are based on anticipated spending on future conservation efforts, including land acquisitions, conservation easement compensation, habitat management efforts, and restoration projects.
- ◆ **Beetle HCP:** Potential impacts associated with the development of the HCP account for another eight percent of forecast impacts. Future impacts are estimated at \$1.8 million. The amounts are driven by anticipated HCP development impacts and expected annual impacts of managing the HCP.
- ◆ **Transportation and Public Works Operations:** Impacts to transportation and public works operations account for another four percent of forecast impacts. Future impacts are estimated to range between \$850,000 and \$922,000. The amounts are driven by the expected cost of modifications to construction activities and/or maintenance of bridges and utility facilities, as well as likely additional costs to site the Northern Tier Transmission Line Project (NTTLP) to avoid the Beetle.
- ◆ **Agriculture:** Agriculture-related conservation impacts account for a little over one percent of forecast impacts. Future impacts are estimated to range between \$95,000 and \$258,000, and are due to anticipated decreases in land value resulting from change of land use from cropland to pasture and the likely impact of conversion of cropland to pasture.
- ◆ **Section 7 Consultations:** Impacts related to Section 7 consultations account for less than one percent of forecast impacts. Future impacts are estimated to range between \$47,000 and \$60,000. The expected impacts consist of one formal and six informal consultations between the Service and relevant entities/agencies.

Unit impacts: Two units, Little Salt Creek – Roper (Unit 3) and Jack Sinn – Rock Creek (Unit 4), are anticipated to account for almost 78 percent of total upper-bound future conservation impacts. These impacts are primarily associated with development restrictions, HCP development, and agriculture.

Distribution of impacts: Private landowners and non-profit and conservation groups account for approximately 54 percent and 29 percent of total anticipated upper-bound future impacts, respectively. Other groups expected to bear projected impacts include local (eight percent), state (seven percent), and Federal governments (two percent).²

¹ Throughout the report, detailed results, including graphical illustrations, are provided using upper-bound impacts and discounted using a three percent discount rate.

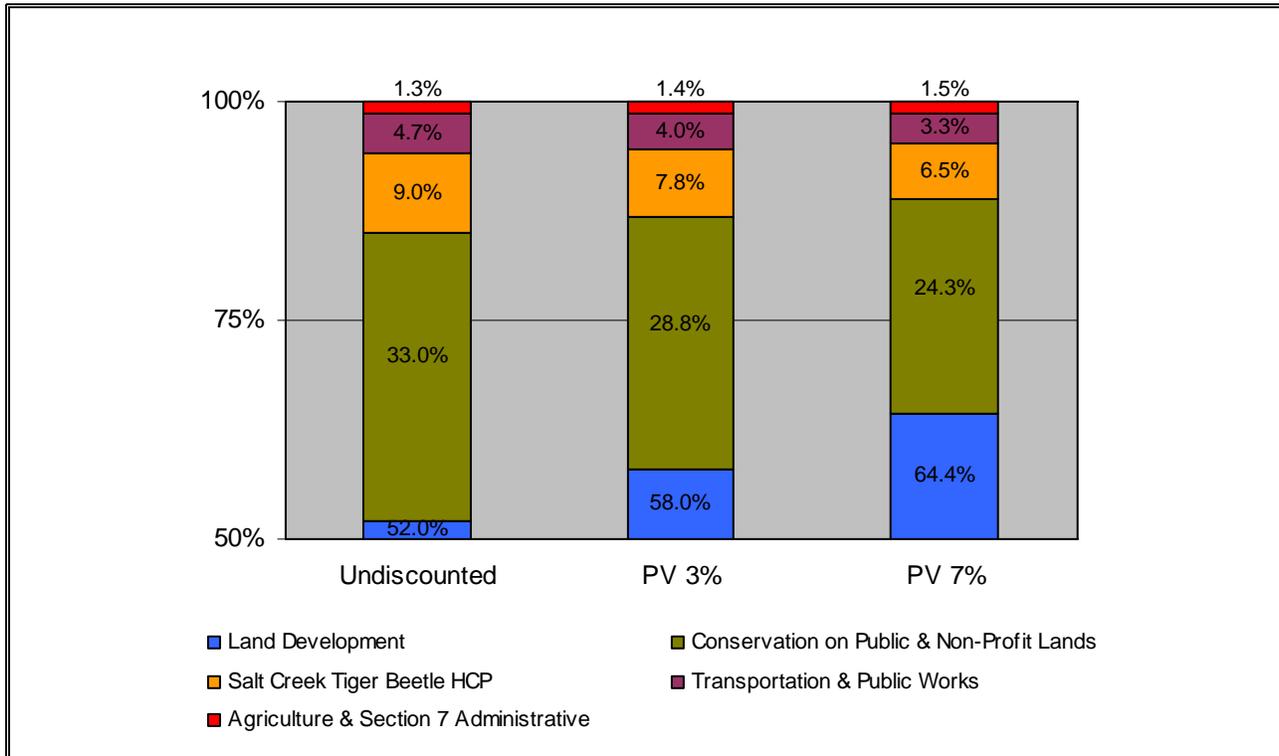
² Percentages may not sum to 100 percent due to rounding.

**Table ES-1
Summary of Conservation Impacts, by Activity (\$1,000s of \$2007)**

Activity	Pre-Designation (Total) (2005-2007)	Post-Designation (Total) (2008-2027)			Post-Designation (Annualized)	
		Undiscounted	3%	7%	3%	7%
Development	\$0	\$13,277	\$13,277	\$13,277	\$893	\$1,254
HCP	\$367	\$2,300	\$1,778	\$1,337	\$118	\$126
Conservation on Public & Non-Profit Lands	\$1,715-\$1,722	\$4,591-\$8,416	\$3,803-\$6,594	\$3,080-\$5,013	\$256-\$443	\$291-\$473
Agriculture	\$0	\$95-\$259	\$95-\$258	\$95-\$256	\$7-\$17	\$9-\$23
Transportation & Public Works	\$464	\$1,101-\$1,201	\$850-\$922	\$631-\$679	\$57-\$62	\$59-\$63
Section 7 Administrative	\$15	\$58-\$75	\$47-\$60	\$36-\$46	\$4	\$4
Total	\$2,561-\$2,568	\$21,422-\$25,528	\$19,850-\$22,889	\$18,456-\$20,608	\$1,335-\$1,537	\$1,743-\$1,943

Note: Results are shown in \$1,000s. Numbers may not sum due to rounding.

**Figure ES-3
Relative Post-Designation Impacts by Affected Activity**



ES.1.1 Development

All post-designation impacts in this executive summary are based on upper-bound conservation impacts calculated at a three percent discount rate. The final listing and proposed critical habitat rules describe urban development as one of the major threats to the Beetle, due to the urban expansion of the City of Lincoln and Lancaster County. Approximately 92 acres, or five percent of the proposed designation, lies within Lincoln's current city limits, while another 197 acres, or 11 percent of the proposed designation, are located outside the city limits, but within Lincoln's 2030 service limit boundary.³

Development to the north of Lincoln's city limits has been limited due to an initiative by the Planning Commission to protect saline and freshwater wetlands within the County. As a result of this initiative, saline wetlands, as well as a 500-foot wide buffer around wetlands located outside the city limits, have been precluded from development since 2002 through the City/County Comprehensive Plan. Additionally, Federal grant funds were recently awarded to the Nebraska Game and Parks Commission (NGPC), as lead agency of a broad partnership of resource organizations, to assist in the creation of the "Salt Creek Tiger Beetle and Eastern Saline Wetlands HCP" in Lancaster and Saunders counties. The City of Lincoln and Lancaster County will continue to protect the saline wetlands and the associated 500-foot buffer until the critical habitat designation is finalized and the HCP is completed. The present width of the buffer is not based upon comprehensive scientific opinion, and may be modified once the research associated with the HCP determines appropriate width to protect the Beetle from lights related to urban development and other indirect development impacts. Thus, it is not certain whether the City and County will continue protecting the Beetle from development with the 500-foot buffer following the completion of the HCP, or if the buffer will be wider or narrower. Absent additional information on the appropriate buffer width to protect the Beetle and saline wetlands from development, the economic analysis assumes the 500-foot buffer may be adopted by the HCP and Comprehensive Plan for the benefit of the Beetle.

Two kinds of impacts to society are anticipated if development is prohibited on the designated land: 1) Increased housing costs and resulting reduced consumer surplus (due to a reduction in housing supply); and 2) Decreased value of land that can no longer be developed. While the former is nominal, the latter is expected to lead to an economic cost to landowners, with 2,635 acres affected within the designation and within the 500-foot buffer surrounding the designation. Following the designation, approximately \$13.3 million in post-designation development impacts due to decreased property values are forecast.⁴

³ The future Lincoln city limits will coincide with the City Planning Commission's future service limits. This is outlined in the Lincoln/Lancaster County Comprehensive Plan 2030, where it is stated that the Commission is following the "policies of ... provision of city utilities only within the city limits." This strategy is singled out as the most effective tool for controlling city growth that the Planning Commission possesses, as this growth cannot occur without the presence of utilities on the land being developed. Moreover, using this tool, the Commission was able to push city growth southward and, at the same time, halt this growth northward, where all of the proposed habitat units are located. Sources: Lincoln/Lancaster Planning Commission, "Lincoln/Lancaster County Comprehensive Plan 2030," November 16, 2006; and personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

⁴ Because these land value declines will occur immediately after the lands are designated (in 2007), the undiscounted and present value results are the same.

Most of these impacts are anticipated to be borne by landowners in the Little Salt Creek – Roper habitat (Unit 3) – as it is the only unit inside the Lincoln city limits and future 2030 service limit (land values are greatest within the city limits and decrease as distance from the city increases). Development-related impacts are primarily expected to be borne by private landowners (92 percent), with eight percent of the impacts (\$1.1 million) being borne by the Board of Educational Lands and Funds (BELF), affecting a total of 40 acres.⁵ While only 30 percent of the affected developable acres are located within the designation (remainder are located in the buffer), almost half of the impacts (\$6.3 million) are expected to occur on lands within the proposed designation.

The lost land value (i.e., growth premium and option value) represents the underlying value of the conservation easements on parcels associated with the species (i.e., the exclusion of development from the proposed designation). Alternatively, the impacts could be presented as the cost of conservation easement acquisitions or conservation programs to protect the species and its habitat. Private owners of parcels affected by the proposed critical habitat may eventually be able to sell the development opportunity (i.e., conservation easement) on their parcels under the future Salt Creek Tiger Beetle HCP Program (Chapter 3.0) or to state or local governments or NGOs interested in acquiring conservation easements (Chapter 4.0). Landowners can also enter their land into a permanent conservation program with the Federal or state government (Chapter 5.0). Under these scenarios, the development impact would accrue to the public or NGO, not the private landowner, as the development opportunity would be purchased from the private landowner with public or NGO funds. Should landowners sell a conservation easement or participate in a permanent conservation program, the total impacts measured by the economic analysis will not change; the only change will be who bears the impact.

ES.1.2 Salt Creek Tiger Beetle HCP

In response to the ongoing development pressure, NGPC, as the lead agency of a broad partnership of resource organizations, is in the process of developing the Salt Creek Tiger Beetle HCP in order to protect the Beetle and the eastern saline wetlands of Nebraska. The HCP will act as the guiding document that will be used by a wide range of Federal, state, and local agencies, conservation organizations, private landowners, and developers. Habitat conservation will be accomplished by a number of different strategies, including land acquisition, conservation easements, state and Federal habitat management incentives, and the development of city and county zoning regulations. The HCP will identify and prioritize areas for conservation activities.

⁵ Past conservation activity illustrates there is active interest among State and local government agencies and NGOs in acquiring (through fee-title or conservation easements) and protecting Beetle habitat. Furthermore, conservation programs are also available that compensate landowners for participation in permanent habitat protection (e.g., USDA Natural Resources Conservation Service Wetland Reserve Program). Should some of the landowners sell (fee-title or conservation easements) their land to State or local agencies or NGOs, or enroll their land in permanent conservation programs, then their impact would be born by the federal, State, or local agency or NGO. In this scenario, impacts to private landowners would be overstated; however, total impacts would not change.

Impacts related to the HCP break down into three components: 1) Cost of developing the HCP (approximately \$866,700); 2) Cost of land acquisition; and 3) Annual cost of managing the HCP (approximately \$100,000 per year commencing in 2010), such as personnel costs, and other costs of managing the saline wetlands. Impacts associated with land acquisition, however, are accounted for in the development impacts portion of this analysis. Approximately \$320,000 of the estimated impacts are expected to occur in 2007, during the pre-designation period. Following the designation, approximately \$1.8 million in total post-designation HCP costs are forecast to develop and manage the HCP. Government agencies and NGOs are expected to bear 99 percent of the HCP costs, with local government agencies financing 39 percent and Federal agencies, local agencies, and NGOs evenly financing 60 percent. The University of Nebraska at Lincoln (UNL) is expected to bear the remaining costs (one percent).

ES.1.3 Public and NGO Conservation Activities

The total pre-designation impacts of Beetle conservation on public and NGO lands are estimated to be approximately \$1.7 million (in 2007 dollars). These impacts were all related to land acquisition and restoration efforts, primarily the Saline Wetlands Conservation Partnership (SWCP) and the Lower Platte South Natural Resource District (LPSNRD). Properties were acquired and restored in units 2 and 4. Approximately 55 percent (\$953,000) of total past impacts are attributed to Little Salt Creek – Arbor Lake habitat (Unit 2), where SWCP initiated an extensive restoration effort in 2006.

In order to derive estimates of potential post-designation impacts, the analysis considers trends in spending and personal communication with local NGOs and public agencies to determine future conservation efforts. Based on the expected spending by these entities, total post-designation impacts of Beetle conservation on public and NGO lands are anticipated to range between \$3.8 and \$6.6 million. These impacts exclude land acquisition costs, as they are considered in the development impacts section of this analysis. The post-designation impact estimates assume that SWCP spending will be distributed within proposed units on a per-acre basis. Given this assumption, the majority of the spending (58 percent) will occur in Jack Sinn – Rock Creek habitat (Unit 4). SWCP is expected to bear most of the impact (93 percent). Some of this impact is also anticipated to be borne by LPSNRD and The Nature Conservancy (TNC) (four percent and three percent, respectively).

ES.1.4 Agriculture

Approximately 82 percent of proposed critical habitat is classified as agricultural land. Nearly all of this land (94 percent) is grassland/pasture, while the remaining six percent is cropland. Threats to the Beetle from agricultural activities within the habitat and surrounding areas identified in the final listing include, but are not limited to, trampling caused by over-grazing, modification of soil hydrology, soil compaction, sediment erosion from surrounding cropland, and introduction of pesticides into the saline wetland areas adjacent to the cultivated land. While all levels of cultivation within and around the critical habitat may be a conservation threat to the Beetle and its habitat, grazing is only considered a threat to the species if it is carried out beyond a certain threshold (i.e., overgrazing).

Two types of anticipated economic impacts related to agricultural activities are quantified in the analysis: 1) Decreased value of land due to a change in land use from cropland to pasture; and 2) The cost associated with the physical conversion of cropland to pasture. Following a review of literature and interviews with local agriculture extension agents, a 120-foot buffer to protect the Beetle and its habitat from sediment and pesticides is applied in this analysis.⁶ The likely diminished land value and conversion costs are calculated for both lands within the proposed designation and within the buffer. No impacts related to grazing are expected as it is assumed that the land manager will graze at the carrying capacity of the land and will not overgraze, since overgrazing would result in lower land productivity in the longer-term. Installation of fencing around the barren salt flats is also suggested for protecting the habitat for Beetle reproduction activities, though associated impacts are not quantified because these are considered to be minor.

Following the designation, approximately \$95,000 to \$258,000 in post-designation agricultural impacts are forecast. Approximately 81 percent of the post-designation agricultural impacts are forecast to occur in Jack Sinn – Rock Creek habitat (Unit 4). In terms of land ownership, private landowners are expected to bear approximately 93 percent of these impacts, with the remainder borne by the state.⁷

ES.1.5 Transportation and Public Works

The City of Lincoln is anticipating expansion towards the north, near the Little Salt Creek – Roper habitat (Unit 3). Associated utility (power lines, pipelines, etc.) development in the area is expected to be affected by the proposed designation. In addition, multiple transportation projects aimed at facilitating the flow of traffic on nearby interstates are in various stages of planning and development. Three main projects associated with growth in the City of Lincoln and surrounding areas may be affected by the proposed designation: 1) The widening of I-80 north of the Lincoln to improve the flow of interstate traffic in the area; 2) Utility development to meet the requirements in the Little Salt Creek area; and 3) Installation of a high voltage transmission line to increase the reliability of the power supply around Lincoln.

Pre-designation impacts include the cost of modifying two major projects to protect the Beetle that have either been completed or are underway; the I-80 Bridge widening projects that are expected to conclude in 2007, and part of the construction on the NTTLP that commenced in January of 2007 and is expected to finish by the end of 2008. Expected post-designation impacts include modifications to the construction

⁶ The width of this buffer, 120-foot, is less than the 500-foot development buffer. The 500-foot buffer is justified in areas where light may be an issue, as lights from urban development attracts Beetle to urban development. However, evening lights are not associated with agricultural fields, thus, a 120-foot buffer is suggested to protect the Beetle and its habitat from pesticides and sediment.

⁷ State and federal conservation programs are available that compensate landowners for participation in the establishment of buffer strips and permanent habitat protection (e.g., USDA Natural Resources Conservation Service Wetland Reserve Program and Nebraska Buffer Strip Program). Should some of the landowners enroll their land in these programs, then their impact would be born by the federal or State government. In this scenario, impacts to private landowners would be overstated; however, total impacts would not change.

and/or maintenance of bridges and utility facilities and remaining impacts to the NTTLP in order to protect the species.

The pre-designation impacts are estimated at \$464,000, while approximately \$850,000 to \$922,000 in post-designation public utility and transportation impacts are forecast. About 59 percent of the post-designation impacts are anticipated to occur in Little Salt Creek – Roper habitat (Unit 3), 31 percent in Little Salt Creek Arbor Lake habitat (Unit 2), and 10 percent in Upper Salt Creek North habitat (Unit 1). In terms of distribution of these impacts, the City of Lincoln is expected to bear approximately 85 percent, with the remainder borne by Lancaster County.

ES.1.6 Section 7 Consultations

Since the federal listing of the Beetle as endangered in 2005, there have been two informal Section 7 consultations (without biological assessments) in the geographic area proposed as critical habitat. Both consultations occurred in 2006, and involved the Nebraska Department of Roads (NDOR) and the bridge expansions of eastbound and westbound I-80 over Little Salt Creek in the northern portion of Little Salt Creek – Roper habitat (Unit 3). The administrative impact of these informal consultations is estimated at \$15,000.

In addition to the two historic consultations, seven project specific consultations are anticipated between 2008 and 2027 (post-designation). These include:

- A formal consultation between NGPC and the Service on the Beetle HCP;
- Four informal consultations between Lancaster County and the Service and Federal permitting agency (such as the ACOE) on various bridge replacements; and
- Two informal consultations between the City of Lincoln and the Service and Federal permitting agency (such as the ACOE): one on the repaving of Arbor Road, and the other on the installation of a water main from 27th Street to 40th Street north of I-80.

These post-designation consultations are expected to result in administrative costs of approximately \$47,000 to \$60,000. The per-unit administrative cost ranges from a high of \$18,000 in Little Salt Creek – Roper habitat (Unit 3) to a low of \$11,000 in Jack Sinn – Rock Creek habitat (Unit 4). The Federal government is expected to bear almost half of the economic impact (49 percent), followed by local governments (33 percent) and the state (19 percent).

ES.2 AREAS MOST LIKELY TO EXPERIENCE IMPACTS

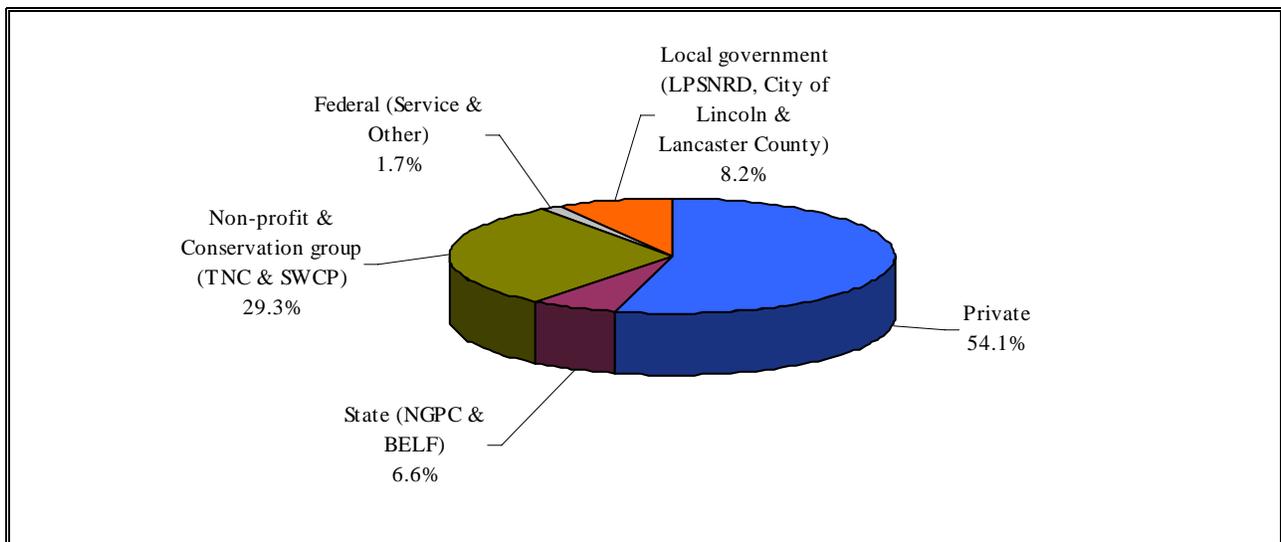
Figure ES-4 illustrates the ranking of proposed designation units by impact. Tables providing detailed impact estimates are presented in Appendix E. As shown, two units account for almost 78 percent of total impacts.

1. Little Salt Creek – Roper (Unit 3): Impacts in Unit 3 are driven by the likely impact of the designation on land values due to restrictions on development. Since this unit is located closest to the City of Lincoln, property values are higher compared to other units and, thus, development restrictions are expected to have a larger effect.
2. Jack Sinn – Rock Creek (Unit 4): Due to its higher acreage (57 percent of total proposed designation), expected post-designation impact estimates for Unit 4 are higher for HCP development and SWCP spending as these impacts are allocated by acre. Also, since there is more cropland in Unit 4, likely agriculture-related impacts are also higher in this unit.

ES.3 DISTRIBUTIONAL IMPACTS

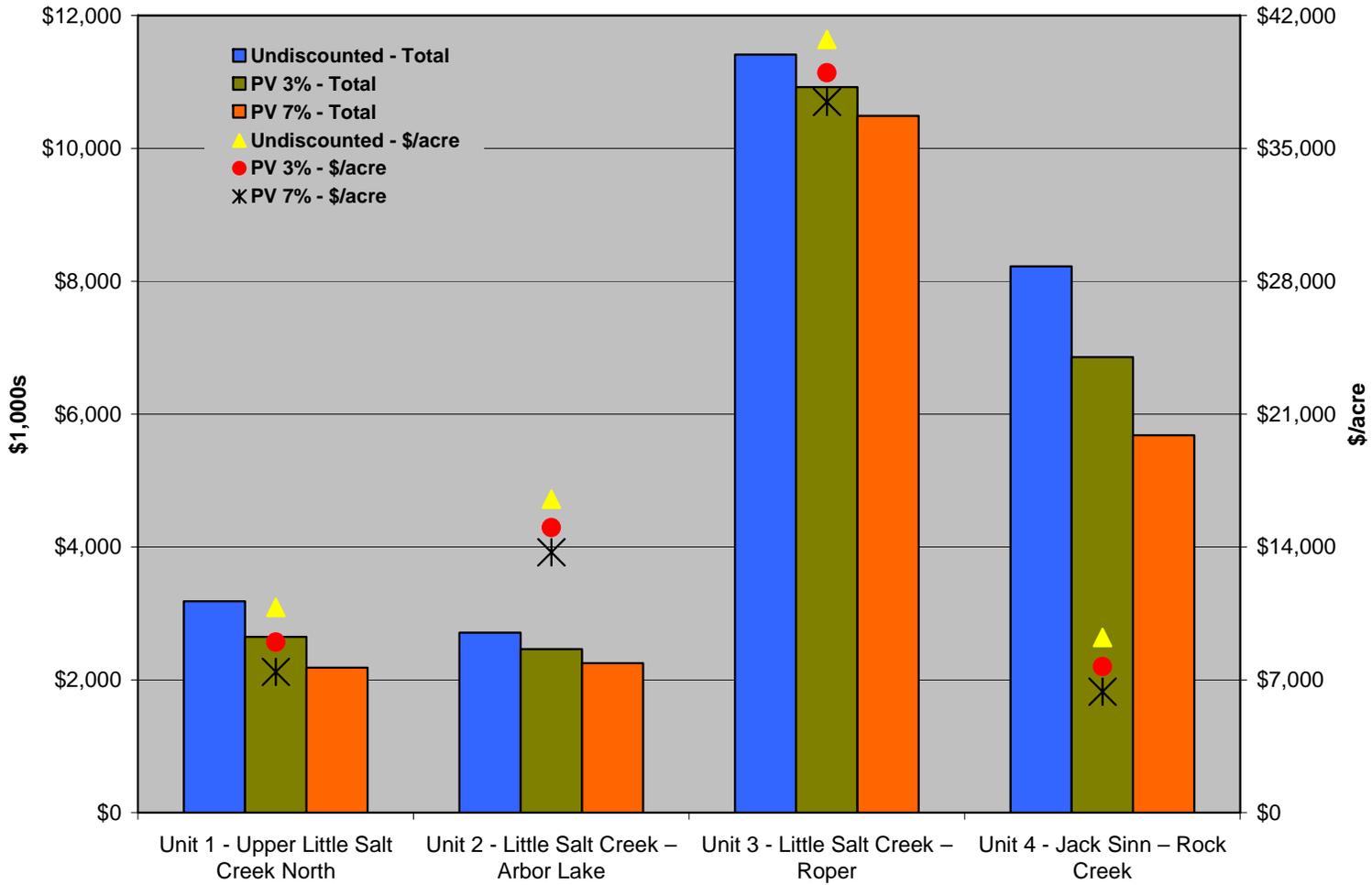
Over half (54 percent) of total expected post-designation impacts accrue to private landowners and nearly one-third (29 percent) accrue to NGOs. The remaining 16 percent accrues to government, with the largest portion borne by local governments (eight percent).

**Figure ES-5
Relative Impact by Affected Party**



This study also analyzes whether a particular group or economic sector is expected to bear an undue proportion of the impacts. Specifically, Appendix B describes potential impacts of proposed designation to small entities.

**Figure ES-4
Economic Impacts by Habitat Unit: Total Impacts and Dollars per Acre (2007\$)**



The purpose of this report is to estimate the economic impact of actions taken to protect the Federally-listed Salt Creek tiger beetle (*Cicindela nevadica lincolniana*, hereafter, referred to as Beetle or “species”). It attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the impact of conservation-related measures that are likely to be associated with future economic activities that may adversely affect the habitat within the proposed boundaries. The analysis looks retrospectively at impacts incurred since the Beetle was federally listed, and it attempts to predict future impacts likely to occur after the proposed critical habitat designation is finalized.

This information is intended to assist the Secretary of the Interior (Secretary) in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.⁸ In addition, this information allows the U.S. Fish and Wildlife Service (the Service) to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).⁹ This report also complies with direction from the U.S. Court of Appeals for the 10th Circuit that “co-extensive” effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.¹⁰

This chapter first provides background information on the species and the proposed designation. Next, it describes the regulatory alternatives considered by the Service. Then, it describes the approach to estimating impacts and lays out the scope of the analysis. Information sources relied upon are summarized in the next section. The chapter concludes with a description of the organization of the remainder of this report.

1.1 BACKGROUND

On October 6, 2005, the Service published the final rule listing the Beetle as endangered (hereinafter, referred to as “final listing”), more than five years after the Beetle was listed as endangered by the State

⁸ 16 U.S.C. §1533(B)(2)

⁹ Executive Order 12866, Regulatory Planning and Review, September 30, 1993; Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5.U.S.C. §601 et seq; and Pub Law No. 104-121.

¹⁰ In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of the proposed designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

(March 2000).¹¹ The Service is in the process of proposing critical habitat of the Beetle, and has drafted a proposed critical habitat designation for the species (hereinafter, referred to as “proposed rule”). For a description of the species and the primary constituent elements that are essential to the conservation of the species, refer to the proposed rule.

The Service has identified 1,778 acres in Lancaster and Saunders counties as proposed critical habitat for the Beetle. Proposed critical habitat is divided into four units. The units are a mix of state, city, non-governmental organization (NGO), and private lands. Tables 1-1 and 1-2 summarize landownership and primary threats by unit. For a map showing the location of each unit, see Figure ES-1 in the Executive Summary.

1.2 REGULATORY ALTERNATIVES

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

1.3 APPROACH TO ESTIMATING ECONOMIC IMPACTS

This economic analysis considers economic efficiency effects that may result from activities to protect the Beetle and its habitat (hereinafter, referred to collectively as “Beetle conservation activities”). Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under Section 7 represent opportunity costs of required conservation activities.

¹¹ 70 *Federal Register* 58335, October 6, 2005.

**Table 1-1
Summary of Land Ownership in Proposed Critical Habitat**

Unit	Name	County	Private Landowners	TNC	Lower Platte South NRD	City of Lincoln	NGPC	BELF	NDOR	Total	
			#	Landowner Acres							
1	Upper Little Salt Creek North	Lancaster	16	115.8	155.8		32.2			303.8	
2	Little Salt Creek – Arbor Lake	Lancaster	3	55.8		111.8				167.6	
3	Little Salt Creek – Roper	Lancaster	14	172.3		68.7	35.3	10.5		286.8	
4	Jack Sinn – Rock Creek	Lancaster	10	407.4			301.9		3.0	712.3	
		Saunders	6	117.4			190.6			308.0	
<i>Subtotal – Rock Creek</i>			<i>16</i>	<i>524.7</i>			<i>492.6</i>		<i>3.0</i>	<i>1,020.3</i>	
Total ¹			49	868.6	155.8	68.7	147.1	524.8	10.5	3.0	1,778.5
Percent of Total				48.8%	8.8%	3.9%	8.3%	29.5%	0.6%	0.2%	

¹ Total may not sum to acreage totals in the proposed rule as some of proposed designation overlaps road right-of-ways, which show up as ownerless in GIS data.

Acronyms used in Table 1-1: TNC – The Nature Conservancy; NRD – Natural Resources District (State), NGPC – Nebraska Game and Parks Commission, BELF – Board of Educational Lands and Funds, NDOR – Nebraska Department of Roads.

**Table 1-2
Primary Threats by Unit**

Units	County	Landowners/ Land Manager(s)	Primary Threats
Upper Little Salt Creek North	Lancaster	State, Private, NGO	Livestock overgrazing, stream entrenchment, ditching, bank sloughing, over-covered saline habitats, loss of saline wetland habitat
Little Salt Creek – Arbor Lake	Lancaster	City, Private	Increased surface runoff, sedimentation, bank sloughing, over-covered saline habitats, overgrazing, row crop agriculture, loss of saline wetlands
Little Salt Creek – Roper	Lancaster	State, City, Private	Commercial and residential developments, increased surface water runoff, sediment transport, creek entrenchment and channelization, bank sloughing, over-covered saline habitats
Jack Sinn – Rock Creek	Lancaster	State, Private	Agricultural land uses, increased surface water runoff, sediment transport, creek entrenchment and channelization, bank sloughing, over-covered saline seeps, loss of adjacent floodplain saline wetlands

1.3.1 EFFICIENCY EFFECTS

At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 “Regulatory Planning and Review,” Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect Beetle habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.¹²

In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager, such as the U.S. Forest Service, may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost, because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets - that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded, given a change in price - the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

¹² For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., *A Guide to Benefit-Cost Analysis (2nd Ed.)*, Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses*, EPA 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

This analysis begins by measuring impacts associated with measures taken to protect the Beetle and its habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. However, if the cost of conservation activities is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets. For this analysis, compliance costs are estimated.

1.3.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

Measurements of changes in economic efficiency focus on the net impact of conservation activities, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.¹³ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

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

This analysis also considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future conservation activities for the Beetle.¹⁴ In addition, in response to Executive Order 13211 “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” this analysis considers the future impacts of conservation activities on the energy industry and its customers.¹⁵

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

¹⁴ 5 U.S.C. § 601 *et seq.*

¹⁵ Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

1.3.1.2 Regional Economic Effects

Regional economic impact analysis can provide an assessment of the potential localized effects of conservation activities. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreationists) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreationists). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

The use of regional input/output models in an analysis of the impacts of species and habitat conservation activities can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

Calculating Present Value and Annualized Impacts

For each land use activity, this analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of species conservation activities; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) of species conservation efforts from year t to T is measured in 2007 dollars according to the following standard formula:^a

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

C_t = Cost of species conservation efforts in year t

r = Discount rate^b

Impacts of conservation efforts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, however, all activities employ a forecast period of 20 years, 2008 through 2027. Annualized impacts of future species conservation activities (APV_c) are calculated by the following standard formula:

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

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

^a To derive the present value of past conservation activities for this analysis, t is 2005 and T is 2007; to derive the present value of future conservation efforts, t is 2008 and T is 2027.

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

1.4 SCOPE OF THE ANALYSIS

This analysis identifies those economic activities believed to most likely threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid, mitigate, or compensate for such threats within the boundaries, or adjacent to, proposed critical habitat. In instances where critical habitat

is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under Section 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers all future conservation-related impacts to be co-extensive with the designation.¹⁶⁻¹⁷

Co-extensive effects may also include impacts associated with overlapping protective measures of other Federal, state, and local laws that aid habitat conservation in the areas proposed for designation. In past instances, some of these measures have been precipitated by the listing of the species and impending designation of critical habitat. Because habitat conservation efforts affording protection to a listed species likely contribute to the efficacy of the critical habitat designation efforts, the impacts of these actions are considered relevant for understanding the full effect of conservation efforts and the proposed critical habitat designation. Enforcement actions taken in response to violations of the Act, however, are not included.

This is important as Beetle conservation pre-dates the federal listing (October 2005) by more than five years following the state listing of the Beetle as endangered (March 2000) under the Nebraska Nongame and Endangered Species Conservation Act (NESCA). The NESCA is administered by the NGPC, and NGPC has regulatory authority, which parallels that of the Act, through “take” prohibition and through consultation on actions authorized, funded, or carried out by state agencies. Unlike the Act, however, NESCA allows “unintentional” or “accidental” take of species and also offers additional protection through take prohibition for plants on non-Federal lands. In addition to species that are only listed at the state level, any species listed as endangered or threatened under the Act is considered endangered or threatened under NESCA.¹⁸ While it is improbable that NGPC would authorize an action that would jeopardize the state endangered Beetle, the impacts of these actions, and other local conservation efforts, are considered relevant for understanding the full effect of conservation efforts and the proposed designation.

1.4.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

This analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act.

¹⁶ In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of the proposed designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Assn v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

¹⁷ In 2004, the U.S. Ninth Circuit invalidated the Service’s regulation defining destruction or adverse modification of critical habitat (*Gifford Pinchot Task Force v. United States Fish and Wildlife Service*). The Service is currently reviewing the decision to determine what effect it (and to a limited extent Center for Biological Diversity v. Bureau of Land Management (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

¹⁸ Personal communication with Rick Schneider, Program Manager, Natural Heritage Program, Nebraska Game and Parks Commission, July 12, 2007.

- Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as critical habitat designation. In this section, the Secretary is required to list species as endangered or threatened “solely on the basis of the best available scientific and commercial data.”¹⁹ Section 4 also requires the Secretary to designate critical habitat “on the basis of the best scientific data available and after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat.”²⁰
- Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat.²¹
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the “take” of endangered wildlife, where “take” means to “harass, harm, pursue, or collect, or to attempt to engage in any such conduct.”²²
- Under Section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop a HCP for an endangered animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.²³

1.4.2 OTHER RELEVANT PROTECTION EFFORTS

The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as state and local governments, may also seek to protect the natural resources under their jurisdiction.²⁴ For

¹⁹ 16 U.S.C. 1533.

²⁰ Ibid.

²¹ The Service notes that the Ninth Circuit judicial opinion, *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, invalidated the Service’s regulation defining destruction or adverse modification of critical habitat. The Service is currently reviewing the decision to determine what effect it (and to a limited extent *Center for Biological Diversity v. Bureau of Land Management* (Case No. C-03-2509-SI, N.D. Cal.)) may have on the outcome of consultations pursuant to section 7 of the Act.

²² 16 U.S.C. 1532.

²³ U.S. Fish and Wildlife Service, “Endangered Species and Habitat Conservation Planning,” <http://endangered.fws.gov/hcp/>, accessed August 6, 2002.

²⁴ For example, the Sikes Act Improvement Act (Sikes Act) of 1997 requires Department of Defense (DoD) military installations to develop Integrated Natural Resources Management Plans (INRMPS) that provide for the conservation, protection, and management of wildlife resources (16 U.S.C. " 670a - 670o). These plans must integrate natural resource management with the other activities, such as training exercises, taking place at the facility.

the purpose of this analysis, such protective efforts are considered to be co-extensive with the protection offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, the critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other state or local laws. In cases where these costs would not have been triggered absent the designation of critical habitat, they are included in this economic analysis.

1.4.3 ADDITIONAL ANALYTIC CONSIDERATIONS

This analysis also considers the potential for other types of economic impacts that can be related to Section 7 consultations in general and proposed designation in particular, including time delay, regulatory uncertainty, and stigma impacts.

1.4.3.1 Time Delay and Regulatory Uncertainty Impacts

Time delay impacts are costs resulting from project delays associated with the consultation process or compliance with other regulations. Regulatory uncertainty costs occur in anticipation of having to modify project parameters (e.g., retaining outside experts or legal counsel to better understand responsibilities with regard to critical habitat). Time delays and regulatory uncertainty impacts are not anticipated in this case, because the Federal agencies involved in consultations are familiar with the process.

1.4.3.2 Stigma Impacts

Stigma refers to the change in economic value of a particular project or activity due to negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting that policy. For example, changes to private property values associated with public attitudes about the limits and costs of implementing a project in critical habitat are known as “stigma” impacts. Stigma effects are a form of uncertainty that relate more to perceived fluctuations rather than observation, when there is limited information on actual outcomes. There is currently a void of peer-reviewed literature that has successfully identified or attempted to quantify empirical estimates of stigma effects. While stigma impacts are possible in locations where critical habitat is designated, the analysis does not anticipate stigma impacts related to species conservation activities.

1.4.4 BENEFITS

Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.²⁵ OMB’s Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable

²⁵ Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.²⁶

In the context of the proposed designation, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.²⁷ *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. Ancillary benefits that affect markets are not anticipated in this case and, therefore, are not quantified.

1.4.5 GEOGRAPHIC SCOPE OF THE ANALYSIS

The geographic scope of the analysis includes the areas proposed for critical habitat designation. The analysis focuses on activities within or affecting these areas, and presents impacts at the lowest level of resolution feasible, given available data. Impacts are reported for each unit identified in the proposed rule. The Executive Summary presents a map of proposed designation units (Figure ES-1).

²⁶ U.S. Office of Management and Budget, "Circular A-4," <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>, accessed September 17, 2003.

²⁷ Ibid.

1.4.6 ANALYTIC TIME FRAME

The analysis estimates impacts based on activities that are “reasonably foreseeable,” including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. This analysis estimates economic impacts to activities from 2005 (year of the species’ final listing) to 2027 (20 years from critical habitat designation, anticipated in 2007). Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

1.5 INFORMATION SOURCES

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

- Board of Educational Lands and Funds (BELF);
- Federal Highway Administration;
- City of Lincoln Nebraska;
- Lancaster County;
- Lancaster County Assessor/Register of Deeds Office;
- Lincoln Department of Public Works;
- Lincoln Electric System;
- Lincoln/Lancaster Planning Commission;
- Lower Platte South Natural Resources District (LPSNRD);
- Nebraska Buffer Strip Program;
- Nebraska Department of Agriculture;
- Nebraska Department of Roads (NDOR);
- Nebraska Game and Parks Commission (NGPC);
- Saline Wetlands Conservation Partnership (SWCP);
- The Nature Conservancy (TNC);
- U.S. Army Corps of Engineers;
- USDA Natural Resources Conservation Service (NRCS);
- U.S. Fish and Wildlife Service; and
- University of Nebraska at Lincoln (UNL);

In addition, this analysis relies upon the Service's Section 7 consultation records, public comments, and published journal sources.

1.6 STRUCTURE OF THE REPORT

The remainder of this report is organized as follows:

- Chapter 2: Potential Economic Impacts to Development;
- Chapter 3: Salt Creek Tiger Beetle HCP;
- Chapter 4: Public and Non-Governmental Organization Conservation Activities;
- Chapter 5: Potential Economic Impacts to Agriculture;
- Chapter 6: Potential Economic Impacts to Transportation and Public Works;
- Appendix A: Administrative Costs;
- Appendix B: Small Business Analysis and Energy Impact Analysis;
- Appendix C: Detailed Maps of Current Land Ownership within Proposed Designation;
- Appendix D: Detailed Maps of Current Land Uses within Proposed Designation; and
- Appendix E: Summary Results at Seven Percent, Three Percent, and Undiscounted.

This chapter describes the past and expected future economic impacts to land development in areas proposed as critical habitat for the Beetle. Specifically, this analysis estimates the economic impacts on land values due to Beetle conservation activities. This chapter is divided into five sections. The first provides an overview of the current restrictions on development in saline wetlands, including the areas proposed as critical habitat. Next is a description of the methods used to estimate the economic impacts of protecting potentially developable land from development activities in order to protect the Beetle and its habitat. This is followed by discussions of past and future economic impacts to land values in the area. The final section presents a brief summary of these impacts.

2.1 BACKGROUND

The final listing and proposed rule describe urban development as one of the major threats to the Beetle, given the urban expansion of the City of Lincoln and Lancaster County.²⁸ In addition to the damage caused by construction activities, the change in drainage patterns as a consequence of development can harm the saline wetlands through the introduction of excess freshwater, sediment, and contaminated urban runoff. Further, highway projects in the vicinity of the proposed designation and the subsequent increase in vehicle traffic can adversely impact the species and its habitat by increasing freshwater runoff, vegetative encroachment, risks of toxic spills, and alteration of drainage patterns.

Approximately 92 acres, or five percent of the proposed designation, lies within the Lincoln city limits, while another 197 acres, or 11 percent of the proposed designation, is located outside the city limits, but within the 2030 City of Lincoln 2030 service limit boundary.²⁹ The remaining acres (approximately 85 percent) are located outside the 2030 service limit boundary. Development to the north of Lincoln's city limits was restricted in 2002, more than three years prior to the federal listing of the Beetle as endangered, with the adoption of the "2025 Comprehensive Plan"³⁰ to protect the saline and freshwater wetlands

²⁸ 70 *Federal Register* 58335, October 6, 2005.

²⁹ The future Lincoln city limits will coincide with the City Planning Commission's future service limits. This is outlined in the Lincoln/Lancaster County Comprehensive Plan 2030, where it is stated that the Commission is following the "policies of ... provision of city utilities only within the city limits." This strategy is singled out as the most effective tool for controlling city growth that the Planning Commission possesses, as this growth cannot occur without the presence of utilities on the land being developed. Moreover, using this tool, the Commission was able to push city growth southward and, at the same time, halt this growth northward, where all of the proposed habitat units are located. Sources: Lincoln/Lancaster Planning Commission, "Lincoln/Lancaster County Comprehensive Plan 2030," November 16, 2006; and personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

³⁰ Lincoln/Lancaster County Planning Commission, May 28-29, 2002, "2025 Comprehensive Plan," Lincoln, Nebraska.

within the County. This restriction was continued under the new “2030 Comprehensive Plan,”³¹ adopted a year after the federal listing. As a result of this initiative, saline wetlands,³² as well as a 500-foot wide buffer around these areas (the buffer only applies to saline wetlands outside the city limits), have been off-limits to development since 2002.³³

In addition to these measures, Federal grant funds were recently awarded to the NGPC, as lead agency of a broad partnership of resource organizations, to assist in the creation of the “Salt Creek Tiger Beetle and Eastern Saline Wetlands HCP” in Lancaster and Saunders counties.³⁴ This HCP will cover future development projects, as well as other development activities such as road projects.³⁵ Until the critical habitat designation is finalized and the HCP completed, the City of Lincoln and Lancaster County will continue to protect the saline wetlands and the associated 500-foot buffer (the buffer only applies to the saline wetlands outside the city limits). The present width of the buffer is not based upon comprehensive scientific opinion, and may be modified once the research associated with the HCP determines the appropriate width to protect the Beetle from lights related to urban development and other indirect development impacts. Following this determination, the “2030 Comprehensive Plan” will also be updated to conform to the final designation and Beetle protective measures formalized in the final HCP to reflect the more sound science.³⁶ Furthermore, it is likely that the land in saline wetlands outside the boundaries of the final designation of critical habitat for the Beetle will be allowed to develop following designation. The Comprehensive Plan will be reviewed in the next annual meeting of the Lincoln/Lancaster Planning Commission and it is probable that wetlands not designated by the Service as critical habitat for the Beetle will be allowed to develop.³⁷ This development is likely to be rural residential, one house on 20 acres, similar to the existing pattern and scale of development in the rural area in the vicinity of Lincoln.

³¹ Lincoln/Lancaster County Planning Commission, November 16, 2006, “2030 Comprehensive Plan,” Lincoln, Nebraska.

³² Personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

³³ Saline wetlands, along with an accompanying 500-foot buffer zone, were targeted for protection in 2002. Due to the uncertainty regarding the appropriate width of buffer to protect the Beetle and the saline wetlands, the City of Lincoln and Lancaster County adopted a 500-foot wide buffer until additional baseline research is completed. Personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

³⁴ U.S. Fish and Wildlife Service, Cooperative Endangered Species Conservation Fund (Section 6) Grants to States & Territories Fiscal Year 2006, <http://www.fws.gov/endangered/grants/section6/FY2006/index.html>, accessed February 16, 2007.

³⁵ Personal communication with Mike Fritz, Natural Heritage Zoologist, Nebraska Game and Parks Commission, February 16, 2007.

³⁶ Personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

³⁷ Ibid, March 16, 2007.

Figure 2-1 Regional Demographics

Most of the proposed designation (85 percent) lies within Lancaster County (land area of 838 square miles), with the remaining habitat located in southern Saunders County (land area of 753 square miles). Although 90 percent (236,000) of Lancaster County's population (265,000 with a population density of 38 people per square mile) lives within the State's capital, Lincoln (land area of 75 square miles), the remaining 29,000 people live in rural areas outside the Lincoln city limits. Saunders County is also primarily rural with a population of 20,000 people (population density of 27 people per square mile).^a

Lancaster County is one of the fastest-growing counties in the State of Nebraska, ranking 3rd in growth rates between 2000 and 2005 (Saunders County ranks 10th).^b This increase is mostly due to the City of Lincoln's fast growth.^c Furthermore, this rate of growth is expected to continue for the next 43 years, with the County population projected to reach more than 390,000 persons by 2030 and 527,000 persons by 2050. The City of Lincoln's population is expected to remain at 90 percent of Lancaster County's population, with an estimated population of 350,000 persons by 2030 and 475,000 persons by 2050. With the population density in the City of Lincoln expected to remain stable at 3,000 people per square mile.^d At forecast growth rates, the City of Lincoln should double in size (to 150 square miles) by 2050. Because 10 percent of the County's population lives outside the Lincoln city limits on 90 percent of the County land area (the rural land area is 763 square miles in the County), there is an ample supply of developable land to accommodate the growing population.^e

^a US Census Bureau, 2005 Census Data, State and County QuickFacts, <http://quickfacts.census.gov/qfd/index.html>, accessed January 19, 2007.

^b "Lancaster County, Nebraska," <http://www.ecanned.com/NE/Lancaster.shtml>, accessed January 19, 2007.

^c Personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

^d Lincoln/Lancaster County Planning Commission, 2006, "2030 Comprehensive Plan," Lincoln, Nebraska.

^e As described in the "2030 Comprehensive Plan," "...sufficient developable land is designated in the Plan to accommodate an overall city-wide density comparable to the current figure....," Lincoln/Lancaster County Planning Commission, 2006, "2030 Comprehensive Plan," Lincoln, Nebraska.

2.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

Species conservation efforts may impose two kinds of impacts to society if development is prohibited on the designated land: 1) Impact to the housing market and consumer surplus, and 2) Loss of value of land that can no longer be developed. The former is expected to be nominal as only 2,635 acres of developable land, a little more than four square miles, will be precluded from development. These acres represent only a small percentage of developable land in the region (see Figure 2-1).³⁸ Thus, the primary

³⁸ As previously described, there is more than 750 square miles of rural land outside the existing Lincoln city limits in Lancaster County. At the forecast growth rate and population density, Lincoln would require another 75 square miles of land area in order to accommodate its growing population. This would only represent about ten percent of the rural land within the County. Given the large amount of private land still undeveloped, even if the County reaches the projected population growth by 2050, the population increase should not cause overcrowding.

impact of species conservation activities for the Beetle is anticipated to be the lost value of land that can no longer be developed.

As stated in the preceding discussion, the economic impact to development is expected to be incurred in the form of the loss of land value due to the limitations on possible land uses that can occur following the designation. However, even though development may not be allowed, most of the private land expected to be impacted by the proposed designation is grassland/pasture, and grazing at appropriate rates may still be permitted (see Chapter 5.0). Therefore, the anticipated lost value of land will equal the difference between the market value (which accounts for the possibility of future development on the land) and the agriculture value of this land.

The framework for estimating the expected lost value of land that can no longer be developed is based on the theoretical models developed by Capozza and Li,³⁹ and Capozza and Helsley.⁴⁰ The price of agricultural land at a given location equals the present value of all future rents; the present value of agricultural rents up to the time of conversion plus the present value of urban rents from the time of conversion onward. Assuming that landowners choose the conversion time to maximize the expected value of land, Capozza and Helsley show that the price of agricultural land has three components: 1) the value of agricultural rents (*VA*); 2) the growth premium (*GP*); and 3) the option value of potential development (*OV*). Formally, the price of agricultural land can be written as:

$$P_a = VA + GP + OV \quad (1)$$

The value of agricultural rents reflects the current use of the land, while growth premium and option value reflect the potential use. Specifically, the value of agricultural rents represents the value of land as an agricultural input, and equals the present value of all future rents to the land. The growth premium equals the present value of expected increases in land rents after being converted to development, and the option value is the value of land derived from the option of future development. Both the growth premium and the option value decrease as distance from the boundary of the urban area increases and time of development moves further into the future. Furthermore, when a development restriction is imposed on a parcel of land, the loss of growth premium and option value will occur immediately after the announcement of the restriction.

For parcels located within Lancaster County, both the price of agriculture land and the value of agriculture rents (P_a and VA in equation 1 above, respectively) are reported for all land, zoned as agricultural, in the Lancaster County Assessor database. The information used is current, with all values

³⁹ Capozza, D.R. and Yuming Li, September 1994, "The Intensity and Timing of Investment: The Case of Land," *The American Economic Review*, Vol.84, No. 4, pp. 889:904.

⁴⁰ Capozza, D. R. and R.W. Helsley, 1990, "The Stochastic City," *Journal of Urban Economics* 28(1990), pp. 187-203.

reported as of 2006.⁴¹ Since the information from this database is available for each parcel of land expected to be affected by the designation in Lancaster County, impacts are estimated at the parcel level and summed to estimate the total impacts for each unit.

Due to the unavailability of parcel-specific information on land value and agriculture rents for parcels located within Saunders County, the analysis assumes that land values for land parcels in southern Saunders County that may be affected by the designation, which border the area expected to be affected by the designation in northern Lancaster County, follows those of nearby land of similar quality in Lancaster County. Therefore, the ratio of arithmetic averages of agriculture to market land values for parcels within the Jack Sinn – Rock Creek habitat (Unit 4) in Lancaster County are estimated and applied to calculate the land value and agriculture rents for the affected Jack Sinn – Rock Creek parcels in Saunders County. Furthermore, because it was not possible to obtain the market value information for each of the Saunders County parcels, a representative per acre market value was developed for each section of land within the target townships and ranges and applied to all parcels within the section.

The methodology also adopts the following assumptions:

- For the few parcels expected to be affected by the proposed designation in Lancaster County that are without Assessor’s information on market value and/or agriculture rents, the arithmetic average agriculture, as well as, in some cases, market values per acre were determined, taking into account nearby parcels with similar topography and zoning designations.
- Developed land, conservation easements dated prior to the federal listing of the Beetle⁴² as well as land owned by public agencies (NGPC, NDOR, LPSNRD, and City of Lincoln) and non-profits (TNC) are excluded from the analysis. One exception is the parcel in the Little Salt Creek – Roper Unit, held by BELF that may be sold to the public in the future.
- The Lincoln/Lancaster County Comprehensive Plan currently restricts development on the saline wetlands, as well as the 500-foot wide buffer around those saline wetlands located outside the city limits. Development, roads, and highways already abut the boundaries of the small portion of the Little Salt Creek – Roper Unit located within the city limits. The 500-foot wide buffer

⁴¹ The County Assessor Department bases its parcel market value assessments on comparable sales and its “special value” (i.e., agriculture value) assessments are based on soil types and production capabilities. Moreover, because 80 percent of a parcel’s “special value” is taxed by the County, the reported agriculture value is divided by 0.8 in order to estimate the full value of agriculture rents. Personal communication with Scott Gaines, Chief Administrative Deputy, Lancaster County Assessor/Register of Deeds Office, February 15, 2007.

⁴² Four conservation easements were purchased before the listing of the Beetle, Dial Salt Creek L.P. Conservation Easement (June 9, 1999), Otto Conservation Easement (April 20, 1988), Martinson Conservation Easement (October 4, 1989), and Sabatka Conservation Easement (April 22, 1992). Because all these easements allow grazing on the protected land, the purchase price of each easement represents the development value of the land.

adopted in the Comprehensive Plan represents a placeholder, until additional research on the appropriate width of buffer to protect the Beetle from development is completed.⁴³ Absent additional information on the appropriate width of buffer, this analysis assumes the 500-foot buffer width will be applied to the saline wetlands and the accompanying 500-foot buffer zone into the future, as currently applied.

2.3 PAST ECONOMIC IMPACTS

While the Comprehensive Plans of 2025 and 2030 have precluded development in the saline wetlands since 2002, there are no past economic impacts associated with development as no species conservation activities directly related to development have been carried out since federal listing of the Beetle in October 2005.⁴⁴ Because the current development restrictions may be modified once the critical habitat designation is finalized and the HCP completed, this analysis treats the lost land value as a future impact that is anticipated to occur immediately after the lands are designated (in 2007).

2.4 FUTURE ECONOMIC IMPACTS

Restricting development is expected to lead to a sizable economic loss with 2,635 acres affected within the designation and within the 500-foot buffer surrounding the designation. Because the Little Salt Creek – Roper Unit is the only unit inside the Lincoln city limits and future 2030 service limit, it is anticipated to bear most of the impacts (see Figure 2-2) because land values are greatest within the city limits and decrease as distance from the city increases (see Table 2-1, units are in order of distance from Lincoln, with Upper Little Salt Creek – Roper closest to Lincoln and Jack Sinn – Rock Creek furthest from Lincoln). Most of the development-related impacts (92 percent) are expected to be borne by private landowners, with eight percent of the impacts (\$1.1 million) being borne by BELF, possibly affecting a total of 46 acres (see Figure 2-2).⁴⁵ Furthermore, 30 percent (778 acres) of the developable acres expected to be impacted by the designation (2,635 acres) are located within the boundaries of the proposed designation, most of the potentially affected acres (70 percent) are located in the 500-foot buffer

⁴³ Personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 17, 2007.

⁴⁴ Personal communication with Mike Dekalb, Planner, Lincoln/Lancaster Planning Commission, January 2, 2007.

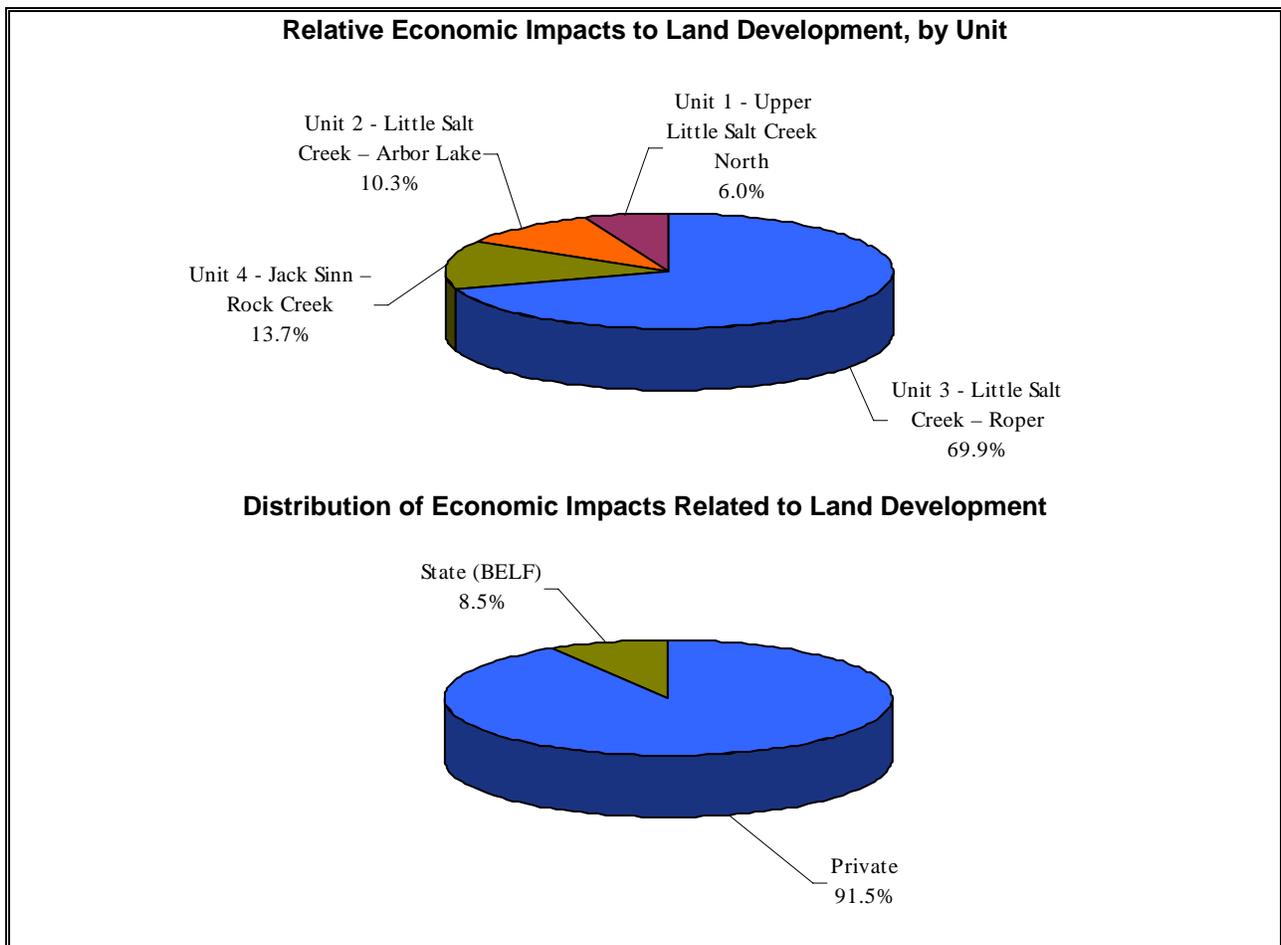
⁴⁵ Past conservation activity illustrates there is active interest among State and local government agencies and NGOs in acquiring (fee-title or conservation easements) and protecting Beetle habitat. Furthermore, conservation programs are also available that compensate landowners for participation in permanent habitat protection (e.g., USDA Natural Resources Conservation Service Wetland Reserve Program). Should some of the landowners sell (fee-title or conservation easements) their land to State or local agencies or NGOs, or enroll their land in permanent conservation programs, then their impact would be born by the federal, State, or local agency or NGO. In this scenario, impacts to private landowners would be overstated; however, total impacts would not change.

(1,857 acres). However, while most of the potentially affected acres are within the buffer, almost half (47 percent) of the impacts (\$6.3 million) are expected to occur on lands within the proposed designation.

**Table 2-1
Total Development Value Lost, by Unit**

Unit	Total Acreage	Total Value Lost	Value Lost Per Acre
Little Salt Creek – Roper	331	\$9,278,740	\$28,008
Little Salt Creek – Arbor Lake	260	\$1,374,297	\$5,291
Upper Little Salt Creek North	466	\$801,173	\$1,720
Jack Sinn – Rock Creek	1,578	\$1,823,180	\$1,155
Total	2, 635	\$13,277,390	\$5,039

**Figure 2-2
Economic Impacts to Land Development**



2.5 SUMMARY OF IMPACTS

The expected development impacts of the proposed designation are estimated using the method described in Section 2.2. Table E-2 in Appendix E provides a summary of development-related impacts that are anticipated to occur due to the designation. There are no pre-designation impacts associated with development. Following the designation, approximately \$13.3 million in post-designation development impacts are forecast. Because these impacts are expected to occur immediately after the lands are designated (in 2007), the undiscounted and present value results are the same. The anticipated annualized impact is estimated to range between \$0.89 million (at three percent) and \$1.25 million (at seven percent).

2.6 CAVEATS

The City of Lincoln and Lancaster County will continue to protect the saline wetlands and the associated 500-foot buffer until the critical habitat designation is finalized and the HCP is completed. However, it is not certain whether the City and County will continue protecting the Beetle from development with the 500-foot buffer, following the completion of the HCP, or if the buffer will be wider or narrower. Absent additional information on the appropriate buffer width to protect the Beetle and saline wetlands from urban development, the economic analysis assumes the 500-foot buffer may be adopted by the HCP and Comprehensive Plan for the benefit of the Beetle.

The lost land value (i.e., growth premium and option value) calculated in Chapter 2.0 represents the underlying value of the conservation easements on parcels associated with the species (i.e., the exclusion of development from the proposed designation).⁴⁶ Alternatively, the impacts quantified in Chapter 2.0 could be presented as the cost of conservation easement acquisitions or conservation programs to protect the species and its habitat. Private owners of parcels affected by the proposed critical habitat may eventually be able to sell the development opportunity (i.e., conservation easement) on their parcels under the future Salt Creek Tiger Beetle HCP Program (Chapter 3.0) or to State or local governments or NGOs interested in acquiring conservation easements (Chapter 4.0). Landowners can also enter their land into a permanent conservation program with the federal or State government (Chapter 5.0). Under these scenarios, the development impact would be to the public or NGO, not the private landowner, as the development opportunity would be purchased from the private landowner with public or NGO funds. Should landowners sell a conservation easement or participate in a permanent conservation program, the total impacts measured by the economic analysis will not change; the only change will be who bears the impact.

⁴⁶ The parcels in Beetle habitat have development-related value as corroborated and monetized in recent conservation easements on lands located within the proposed designation (e.g., Olson & Otto (1986), Sabatka (1992), Martinson (1989), and Dial-Salt Creek LP (1999)).

The NGPC, as the lead agency of a broad partnership of resource organizations, including the City of Lincoln, Lancaster County Board of Commissioners, LPSNRD, NDOR, UNL, SWCP, TNC, NRCS, and the Service (collectively the HCP Team), is in the process of developing a new Habitat Conservation Plan (HCP) in order to protect the Beetle and the eastern saline wetlands of Nebraska.⁴⁷ The HCP is being developed in response to development pressure, which is threatening the viability of the saline wetland ecosystem in the area. The goal of the HCP is to: (1) provide a comprehensive plan that will ensure the long-term conservation of the Beetle, the State's eastern saline wetlands, the State endangered saltwort, and other non-listed species dependent on the saline wetlands; (2) provide regulatory assurances to developers, local government officials, and private landowners in Lancaster and Saunders counties; and (3) provide information necessary for the preparation and implementation of the Recovery Plan for the Beetle.⁴⁸ The following section summarizes information pertaining to the timing, effort, and cost of developing the Salt Creek tiger beetle HCP.

3.1 BACKGROUND⁴⁹

The Salt Creek tiger beetle HCP is an umbrella plan that is intended to develop conservation strategies for the recovery and long-term viability of the species and the protection and management of saline wetland habitat. The HCP will act as the guiding document that will be used by a wide range of Federal, state, and local agencies, conservation organizations, private landowners, and developers for undertaking conservation activities. Habitat conservation will be accomplished by a number of different strategies including: land acquisition, conservation easements, state and Federal habitat management incentives, and the development of city and county zoning regulations.

It is anticipated that zoning regulations and guidelines will be enacted based on the recommendations developed in the HCP. These will address development issues related to land use; development of public recreation areas associated with Beetle habitat; protection of green space and natural areas; location and type of residential, commercial, and public (i.e., roads, schools, sewer) development within watersheds that contain Beetle habitat; buffer distances and types between Beetle habitat and development; and water

⁴⁷ U.S. Fish and Wildlife Service Section 6, Habitat Conservation Planning Assistance Grants: FY 2007, Nebraska Game and Parks Commission, Nebraska Habitat Conservation Planning Assistance Grant Application, "Habitat Conservation Plan for the Salt Creek Tiger Beetle and Eastern Saline Wetlands of Nebraska."

⁴⁸ Ibid.

⁴⁹ Information for this section was developed from personal communication with Mike Fritz, Natural Heritage Zoologist, Nebraska Game and Parks Commission, February 16, 2007.

runoff and quality (i.e., overflow storage in wetlands during high-water events, stream bed stabilization, and reduction of stream bank erosion from head-cutting).

3.2 HCP DEVELOPMENT⁵⁰

Although the development of the HCP is not separated into defined phases, activities are expected to pursue the following sequence:

- First Phase – Conduct research related to Beetle life history, habitat requirements, saline wetland ecology and associated species, and hydro-geology of saline wetlands; develop video and educational materials for public outreach; and conduct a series of public meetings to educate the public and obtain input from the public, landowners, and development interests. The initial draft of the HCP will also be developed during this phase.
- Second Phase – Incorporate results of research into the HCP; identify conservation, management, and monitoring strategies and priorities; input these into final HCP draft; develop NEPA documents; and finalize the HCP after NEPA review process.

It is anticipated that work on the HCP will commence in the spring of 2007. The first phase will be conducted in 2007 and 2008, during the first two years of the project. The second phase will be carried out in the third year of the project, with completion of the final HCP document estimated for December of 2009.

3.2.1 DEVELOPMENT IMPACTS

In 2006, the NGPC submitted a Section 6 Habitat Conservation Planning Assistance Grant proposal to the Service for funding an HCP for the Beetle. The proposal was for carrying out five major activities: Biological Inventory (\$133,400), Hydrological Research (\$506,700), Public Education/Outreach (\$53,300), Development of the HCP (\$80,000), and Development of Environmental Documents (\$93,300). The total budget request for the HCP planning process was \$866,700, of which \$650,000 was funding from the Section 6 grant request from the Service and \$216,700 was the required 25 percent matching funds from the HCP Team (see Table 3-1). The Service awarded the NGPC \$500,000 in September of 2006 toward the development of the HCP.⁵¹ This funding is anticipated to be used to undertake the biological inventory and hydrological research components of the proposal, which are both

⁵⁰ Information for this section was developed from personal communication with Mike Fritz, Natural Heritage Zoologist, Nebraska Game and Parks Commission, February 16, 2007.

⁵¹ U.S. Fish and Wildlife Service, Cooperative Endangered Species Conservation Fund (Section 6) Grants to States & Territories Fiscal Year 2006, <http://www.fws.gov/endangered/grants/section6/FY2006/index.html>, accessed February 16, 2007.

two-year long studies. A portion of the funding is also expected to be used in public education/outreach and to begin the development of the HCP document.

In January of 2007, the NGPC submitted a second Section 6 Habitat Conservation Planning Assistance Grant proposal to the Service in order to complete the grant proposal as originally submitted.⁵² The funding request for 2007 is for \$150,000 from the Service, which is expected to be matched with \$37,500 from the HCP Team. This will bring the total amount funded by the Service to \$650,000, as was requested in the 2006 proposal. This second source of funding is anticipated to be used for completing the public education/outreach, finishing the development of the HCP document, and undertaking the development of necessary environmental documents.⁵³ Based on this schedule, \$366,000, or 42 percent, of the estimated costs to develop the HCP will occur in 2007, during the pre-designation period (half of the biological inventory and hydrological research activities).

**Table 3-1
Estimated Impact of Developing the Salt Creek Tiger Beetle HCP**

Item	Service Funding	Partner's Match	Total
Biological Inventory	\$100,000	\$33,400	\$133,400
Hydrological Research	\$380,000	\$126,700	\$506,700
Public Education/Outreach	\$40,000	\$13,300	\$53,300
Development of HCP	\$60,000	\$20,000	\$80,000
Environmental Documents	\$70,000	\$23,300	\$93,300
Total	\$650,000	\$216,700	\$866,700

Source: U.S Fish and Wildlife Service Section 6, Habitat Conservation Planning Assistance Grants: FY 2007, Nebraska Game and Parks Commission, Nebraska Habitat Conservation Planning Assistance Grant Application, "Habitat Conservation Plan for the Salt Creek Tiger Beetle and Eastern Saline Wetlands of Nebraska."

Match for the Section 6 grant is expected to come in the form of both match funding and in-kind contributions. In-kind match will be from personnel time for agencies and organizations, approved overhead costs from the UNL, and match of equipment, materials, and supplies. Funding match will be from a Nebraska Environmental Trust grant.

⁵² U.S. Fish and Wildlife Service Section 6, Habitat Conservation Planning Assistance Grants: FY 2007, Nebraska Game and Parks Commission, Nebraska Habitat Conservation Planning Assistance Grant Application, "Habitat Conservation Plan for the Salt Creek Tiger Beetle and Eastern Saline Wetlands of Nebraska."

⁵³ It is possible that research activities to be conducted under the current grants will identify additional research necessary for the development of the HCP. Additional funding will be sought based on any future needs. Further, the completion of the NEPA process may require additional funding. Any such identified funding will be pursued in cooperation with the Service.

3.3 HCP IMPLEMENTATION⁵⁴

In addition to the impacts associated with developing the HCP, other impacts related to the HCP implementation are anticipated, such as land acquisition and ongoing monitoring and management, which will be the responsibility of the HCP Team.

3.3.1 MANAGEMENT COSTS

Future management costs are difficult to predict, since there is no established recovery plan available for the Beetle and, therefore, no clear picture of what the HCP Team is expected to accomplish via the HCP. Absent cost information specific to the Beetle HCP, this analysis applies the annual management costs estimated for a similarly sized HCP in Benton County, Oregon. The County estimated the total impact of developing the HCP as \$904,875, about four percent higher than the estimated impact to develop the Beetle HCP. Further, similar to the timeline for developing the Beetle HCP, the Benton County HCP was expected to take three years to complete (spring 2006 to spring 2008). Once completed, it was estimated that the Benton County HCP would require approximately \$100,000 annually for ongoing management.⁵⁵

As previously described, a number of entities are currently involved at several levels in the development of the HCP, Beetle research and conservation, and the protection of saline wetland habitat. These entities are also involved in various aspects of managing habitat for the species. It is anticipated that representatives from these entities will function as a group to provide oversight and coordinate the implementation of the various aspects of the HCP when it is completed.

Currently, Beetle-management activities and costs are supported by the NGPC Wildlife Division, the City of Lincoln Parks and Recreation Department, the LPSNRD, and TNC. These entities provide funding, personnel, and equipment for the active management of existing Beetle habitat. It is anticipated that these entities will continue to provide land management support. However, as the size and number of protected habitat areas increase, there will also be an increase in management costs. Some of these costs will need to be addressed through funding increases from the HCP Team members, or through additional funding sources or grants for specific restoration and management projects. Furthermore, upon completion of the HCP, it is anticipated that city and county zoning regulations and guidelines will be modified based on the scientific research, especially regarding the appropriate width of the buffer. The zoning regulations and guidelines enacted will be administered by the appropriate personnel in the respective planning departments.

⁵⁴ Information for this section was developed from personal communication with Mike Fritz, Natural Heritage Zoologist, Nebraska Game and Parks Commission, February 16, 2007.

⁵⁵ U.S. Fish and Wildlife Service, 2006, "Final Economic Analysis of Critical Habitat Designation for Three Willamette Species," pp. 42-45.

3.3.2 LAND ACQUISITION IMPACTS

It is envisioned that the HCP will include an active land acquisition program. At this point, however, there are no specific goals as to the targeted amount of land preservation. This will be determined based on results of the life history and hydro-geology research, and the designation of critical habitat by the Service. Future land preservation under the HCP will be coordinated with existing preservation efforts. Land acquisition for the conservation of saline wetlands and the Beetle has been taking place for several years. The tracts acquired to date (through acquisition of fee-title and conservation easements) are held by a variety of organizations, including NGPC, the City of Lincoln, LPSNRD, SWCP, and TNC. The HCP will help identify where the gaps in land preservation are located, so that these areas can be targeted for acquisition. The land acquisition program will be voluntary, i.e., involving willing sellers, and will rely on a mixture of conservation easements and fee-title acquisition.

Land acquisition to date has been funded by two Service Section 6 Land Acquisition grants and two Nebraska Environmental Trust grants. A third Service Section 6 Land Acquisition proposal was submitted in early 2007. It is anticipated that future land acquisitions will be funded through Service Section 6 Land Acquisition and Nebraska Environmental Trust grants. Habitat on private lands is also expected to be conserved through the use of management incentives funded through programs such as the NRCS's Wetland Reserve Program, the NGPC's Landowner Incentive Program, and the Service's Private Lands Stewardship Program.

The final results in this chapter of the economic analysis only report the anticipated impacts associated with developing and managing the HCP. The cost of acquiring conservation easements is already captured in Chapter 2.0, which estimates the expected impact of land use restrictions imposed on landowners by conservation efforts associated with the species (i.e., the exclusion of development from the designation). The lost land value (i.e., growth premium and option value) calculated in Chapter 2.0 represents the underlying value of the conservation easements that the HCP Team will purchase under its HCP Program. Private owners of proposed critical habitat in the counties could sell the development opportunity (i.e., conservation easement) on their land to the HCP Team under the HCP if their land is part of the desired HCP land acquisition. Under this scenario, the development impact in Lancaster and Saunders counties would be to the public, not the private landowner, as the development opportunity would be purchased from the private landowner with public funds. Thus, to account for both the lost land value associated with restricting development from a landowner's property and the cost to the HCP Team of purchasing conservation easements to preclude development from that same piece of property would double count the impact of species conservation.

3.4 SUMMARY IMPACTS

As described in preceding paragraphs, anticipated HCP-related impacts break down into three components: (1) the cost of developing the HCP (approximately \$866,700); (2) the cost of land acquisition; and (3) the annual impact of managing the HCP (approximately \$100,000 per year). Only the impacts associated with developing and managing the HCP are reported in the final results of this chapter

of the economic analysis. Given that the HCP is expected to take three years to develop, the economic analysis assumes annual management commences in 2010, after the completion of the HCP.

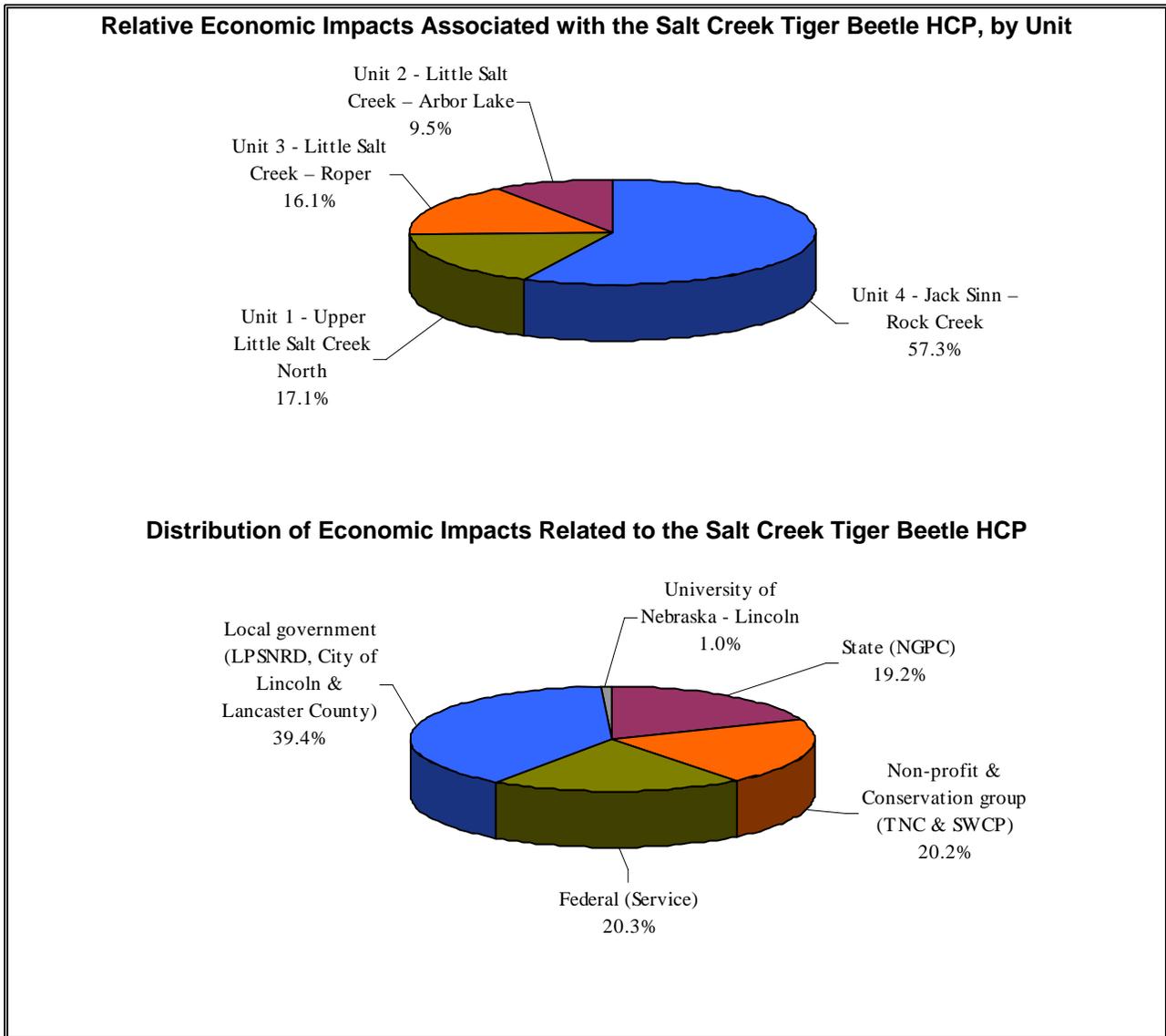
Table E-3 in Appendix E provides a summary of HCP-related impacts that are anticipated to occur due to the critical habitat designation of the Beetle. Approximately \$367,000 of the estimated impacts are expected to occur in 2007, during the pre-designation period (half the cost of the biological inventory and hydrological research activities). Following the designation, approximately \$2.3 million in post-designation HCP costs (remaining costs to develop the HCP and ongoing HCP management) are forecast in undiscounted dollars, or \$1.8 million and \$1.3 million in present value terms at discount rates of three and seven percent, respectively. Over 57 percent of the post-designation HCP impact is forecast to occur in the Jack Sinn – Rock Creek habitat (Unit 4) (see Figure 3-1).⁵⁶ Local government agencies (i.e., LPSNRD, City of Lincoln, and Lancaster County Board of Commissioners) are expected to bear most of the impact (39 percent), while Federal agencies (i.e., Service and NRCS), state agencies (i.e., NGPC), and non-profit/conservation groups (i.e., TNC and SWCP) are each expected to bear approximately 20 percent of the impact, and the remaining impact is anticipated to be borne by UNL (one percent) (see Figure 3-1). Expected annualized impacts are estimated to range between \$118,000 (at three percent) and \$126,000 (at seven percent).

3.5 CAVEATS

Absent cost information specific to the Beetle HCP, this analysis applies the annual management costs estimated for a similarly sized HCP in Benton County, Oregon. Once completed, it was estimated that the Benton County HCP would require approximately \$100,000 annually for ongoing management and operations. To the extent that this analysis over or underestimates the management cost of the HCP, the future estimated costs may be over or understated.

⁵⁶ HCP impacts are allocated by acre, and the Jack Sinn – Rock Creek habitat (Unit 4) contains almost 55 percent of the proposed critical habitat designation.

**Figure 3-1
Economic Impacts Related to the Salt Creek Tiger Beetle HCP**



PUBLIC AND NON-GOVERNMENTAL ORGANIZATION CONSERVATION ACTIVITIES

This chapter describes the conservation and management efforts of public and NGOs to promote the survival of the Beetle. Conservation efforts quantified in this chapter can range from weed-pulling to land acquisitions, but must have a direct benefit on the species and/or its habitat. The chapter is divided into five sections, with costs and expenditures discussed over three time periods; historic/pre-listing (pre-September 2005), past/pre-designation (October 2005 to December 2007), and expected future/post-designation (January 2008 to December 2027). The first section offers an overview of the conservation and management activities occurring in the proposed designation, and a discussion of the historic impacts of species conservation. This is followed by a description of the methodology used to derive estimates of past and future impacts. The next two sections evaluate the impacts associated with past and future Beetle conservation efforts. Finally, a summary of all past and future impacts due to species conservation and management activities is presented.

4.1 BACKGROUND AND HISTORIC IMPACTS

The Beetle was listed as endangered by the NGPC in 2000 and by the Service in October 2005. Numerous conservation projects transpired between the State and Federal governments' listing of the species. This section discusses some of these actions, as these are considered pertinent to present activities. The impacts of these actions, however, are not attributed to species conservation as they took place before the Federal listing. Table 4-1 provides a general summary of the historic impacts and corresponding actions, but only includes major restoration projects and undertakings such as land acquisitions and conservation easements. The remainder of this section elaborates upon these efforts and provides background information on past and ongoing conservation programs.

Table 4-1
Historic Conservation Efforts by SWCP

Location	Date	Impact	Action
All Units	2002-2005	\$187,500	SWCP administrative and overhead costs.
Upper Little Salt Creek North (Unit 1)	June 2004	\$294,500	Acquisition of 1 st and Raymond Road property from BELF.
Little Salt Creek-Arbor Lake (Unit 2)	June 2003	\$517,100	Acquisition of Frank Shoemaker Marsh property.
	September 2005	\$373,400	Acquisition of Anderson property.
	2003-2005	\$11,700	Supporting costs (i.e. title insurance, signage, taxes).
Little Salt Creek-Roper (Unit 3)	September 2004	\$218,400	Acquisition of Melvin King property.
	2003-2004	\$16,800	Supporting costs.
Total		\$1,619,500	

4.1.1 THE SALINE WETLANDS CONSERVATION PARTNERSHIP

In 2002, the City of Lincoln was awarded \$750,000 from the Nebraska Environmental Trust to implement the Eastern Saline Wetlands Project. Following this, SWCP was formed in 2003 through the collaboration of five partner organizations; the City of Lincoln, Lancaster County, LPSNRD, TNC, and NGPC. Although other non-profit organizations and special interest groups (i.e. Home Builders Association, Ducks Unlimited, and Wachiska Audubon) have also contributed towards funding the SWCP, the five primary partners have each contributed approximately \$75,000 every three years since 2003.⁵⁷

The primary purpose of establishing the SWCP was to coordinate saline wetland conservation and restoration efforts with a concerted approach instead of the piecemeal projects being executed by each partner independently. The goal of SWCP is “No net loss of saline wetlands and their associated functions with a long-term goal in sustaining wetland functions through the restoration of hydrology, prescribed wetland management, and watershed protection.”⁵⁸ SWCP seeks to accomplish its goal by employing a diverse conservation toolbox, including the purchase of wetland habitat in fee title ownership, establishment of conservation easements, habitat and watershed restoration projects, and education and outreach programs.

4.1.2 LAND ACQUISITIONS AND CONSERVATION EASEMENTS

Some lands containing or neighboring saline wetlands in Lancaster and Saunders counties have been acquired by public entities and NGOs for the protection of the Beetle or its unique habitat. These organizations have also compensated private property owners for establishing conservation easements. While the latest of these efforts was in 2007, all other land acquisitions and easements took place during the pre-listing period and, therefore, are not attributable to the conservation of the species. However, as demonstrated in Table 4-1, it is estimated that \$1.6 million was spent on land acquisitions and conservation easements during the pre-listing period.

4.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

Past impacts for this analysis are derived from the documentation of a transaction, budget line items, personal communications with experts and officials of relevant agencies, and the pricing of materials or volunteer labor. Expected future impacts are more assumptive, as funding for proposed projects is undeterminable and uncertain due to unforeseen circumstances that can result in a redistribution of

⁵⁷ Personal communication with Tom Malmstrom, Director, Saline Wetlands Conservation Partnership, January 8, 2007.

⁵⁸ Saline Wetlands Conservation Partnership, March 2003, “Implementation Plan for the Conservation of Nebraska’s Eastern Saline Wetlands,” Executive Summary.

intended funding. To account for this, a more conservative approach with ranges of estimates is employed.

4.2.1 THE SALINE WETLANDS CONSERVATION PARTNERSHIP

Some SWCP efforts occur outside the proposed designation but in abutting properties. However, these conservation and management efforts are also considered to have a direct benefit on the species, since they improve the quality of the overall habitat and watershed. While assigning impacts on a per-acre ownership basis was considered, given the unique hydrologic properties of Nebraska's saline wetlands, this analysis assumes that efforts taking place in the greater habitat are directly beneficial to the Beetle and the proposed designation. Therefore, conservation and management expenditures occurring in properties adjacent to the Beetle habitat are attributed to the species survival and preservation. However, SWCP efforts occurring on properties not abutting the proposed designation are regarded as not having a direct benefit on the species, since it is unlikely that these actions will have a measurable impact on the quality of the habitat.

4.2.2 LAND ACQUISITIONS AND CONSERVATION EASEMENTS

Although land acquisitions and conservation easements are considered species conservation efforts, the costs of these transactions in the analysis are captured by the foregone opportunity to use the land for development or agricultural production. In order to avoid double-counting the value of these efforts, this section does not consider funds spent to perform real estate transactions as conservation efforts. Rather, these values are captured in the development model employed in estimating development impacts presented in Chapter 2.0 of this report. Chapter 2.0 also discusses the economic implications of reserving properties for conservation purposes in greater detail. However, this chapter does evaluate and analyze one real estate transaction, the purchase and sale of the Noble Tract, due to its complexity.

4.3 PAST ECONOMIC IMPACTS

As per prior discussion, monies spent on species conservation activities and habitat management between October 2005 and December 2007 are considered past impacts in this analysis. Total past economic impacts associated with species conservation activities tally to approximately \$1.72 million, with over half being spent in the Little Salt Creek – Arbor Lake area (Unit 2). This section describes the primary conservation efforts occurring in each unit within the proposed designation that constitute total past impacts.

4.3.1 SUMMARY OF CONSULTATION HISTORY

There are no ESA Section 7 Consultation costs, since no such consultations with the Service regarding conservation efforts have been carried out. This is mostly attributed to the absence of a Federal nexus where habitat restoration and management efforts have taken place or have been proposed.

4.3.2 SHOEMAKER RESTORATION

In June 2003, SWCP acquired a 160-acre piece of property known as the Frank Shoemaker Marsh. During 2006, SWCP initiated an extensive restoration project on the property by consulting the Flatwater Group of Lincoln, Nebraska to engineer the conceptual design. While the funds spent to acquire the property are not considered past economic impacts, all planning and construction efforts are quantified in this analysis.

The planning and design phase of this restoration effort cost SWCP about \$220,000 and the price of the construction phase is estimated to be about \$900,000, adding to a total cost of \$1.2 million.⁵⁹ Amongst other substantial undertakings, the Flatwater Group recommended the installation of “drop structures” in order to abate runoff and control the flow of water into the habitat. The Shoemaker restoration project will continue into 2008, when approximately \$250,000 of the \$1.2 million is expected to be spent. Therefore, the total past impact associated with this conservation effort is anticipated to be roughly \$950,000. This is the most extensive restoration and habitat management initiative undertaken by the SWCP.

4.3.3 JACK SINN RESTORATION

SWCP is conducting a restoration project on an NGPC wildlife management area (WMA) that coincides with the Beetle habitat in Jack Sinn – Rock Creek habitat (Unit 4). SWCP spent approximately \$170,000 in 2006 to initiate the project on the more than 1,000-acre site.⁶⁰ The sources of this funding are a USEPA Clean Water Act Section 319 grant and the Nebraska State Wildlife Fund. The USEPA Section 319 grants are specifically dedicated for the abatement of non-point source runoff pollution. SWCP has applied this funding towards installing flow and runoff control structures, as well as fencing and signage to protect habitat quality.

4.3.4 WHITEHEAD RESTORATION

LPSNRD is engaged in a habitat management project on a 99-acre property known as the Whitehead Wetlands. The Whitehead Wetlands are part of the Beetle habitat in Little Salt Creek – Roper habitat (Unit 3). The NRD has spent a little over \$100,000 on the design and construction of “drop structures” and an interpretive kiosk for visiting naturalists.⁶¹

⁵⁹ Personal communication with Tom Malmstrom, Director, Saline Wetlands Conservation Partnership, January 8, 2007.

⁶⁰ Ibid.

⁶¹ Personal communication with Dan Schulz, Resource Coordinator, Lower Platte South Natural Resources District, January 25, 2007.

4.3.5 NOBLE TRACT PROPERTY ACQUISITION

Another substantial conservation effort occurring in the pre-designation period is SWCP's acquisition of a 100-acre piece of property from TNC. This property, known as the Noble Tract, is located in the southern portion of the Upper Little Salt Creek North habitat (Unit 1). The acquisition is a three-way transaction between TNC, LPSNRD, and NGPC/SWCP. The appraised value of the property is approximately \$336,000, and TNC acquired the property for about \$150,000 in 2003. Since TNC is bound by its charter to not sell conservation property for profit, it intends to sell the land to LPSNRD for the original acquisition price of \$150,000. After holding the property for a month, LPSNRD will sell Noble Tract to NGPC/SWCP for the appraised value of \$336,000. The additional amount of over \$180,000 recouped by LPSNRD will be committed to a restricted account that is dedicated for future land acquisitions and conservation easements.⁶² TNC is also dedicated to redistributing the \$150,000 it incurs during these transactions as \$30,000 annual grants for conservation of the species and its habitat between 2009 and 2014.⁶³ While various transactions will occur within this acquisition, the total pre-designation conservation spending for this action remains at \$336,000. Although the revenues realized by TNC and LPSNRD will not be utilized until the post-designation period, the NGPC/SWCP spending is anticipated to occur in the pre-designation period and is attributed as such.

4.4 FUTURE ECONOMIC IMPACTS

Monies expected to be spent on species conservation activities between 2008 and 2027 are considered future impacts. While officials from relevant organizations tend to have a good grasp on spending estimates in the years immediately following the designation, given the unpredictable nature of public grants and NGO project funding, conservation spending many years into the future is difficult to forecast. In order to account for these efforts in the most accurate manner, this study observed trends in spending to typify future conservation efforts and worked closely with the appropriate parties to derive expected impact estimates.

4.4.1 THE SALINE WETLANDS CONSERVATION PARTNERSHIP

The total attributable value of SWCP's future conservation efforts is expected to range from \$3.5 to \$4.1 million. According to SWCP estimates, it will spend between \$500,000 to \$1.0 million annually through 2012, then \$100,000 to \$300,000 each year in perpetuity.⁶⁴ During the years immediately following the designation (2008 to 2012), SWCP anticipates spending funds for land acquisitions, conservation

⁶² Personal communication with Dan Schulz, Resource Coordinator, Lower Platte South Natural Resources District, January 25, 2007.

⁶³ Personal communication with John Heaston, Project Director, Central Nebraska Project Office, The Nature Conservancy, January 31, 2007.

⁶⁴ Personal communication with Tom Malmstrom, Director, Saline Wetlands Conservation Partnership, February 12, 2007.

easement compensation, and restoration projects. After 2012, SWCP expects to use the funding for habitat management and restoration, but not for property acquisitions and/or conservation easements. In order to avoid double-counting the economic impacts of land acquisitions and conservation easements with the lost opportunity cost of foregoing development or agricultural production, the land and conservation easement acquisitions were factored out of the estimates in the years up until 2012. This value is captured in the opportunity cost of development (see Chapter 2.0).

Assuming SWCP wants to realize the most efficient allocation of funding, it is unlikely that it will purchase property in the proximity of the Little Salt Creek – Roper habitat (Unit 3). Since property in this area has higher market value in comparison to other units in the proposed designation, the Partnership can acquire relatively more saline wetlands in areas other than Unit 3. The market value of land is a function of its proximity to the City of Lincoln, and decreases as the distance of the property from the City increases. In other words, the further north from the City the property is, the more the agricultural value is representative of total value, while the development value decreases. To account for this trend, a percentage of market value was deducted from the expected spending estimates since this portion of the total value is captured under the development model presented in Chapter 2.0 of this report. Specifically, it is assumed that 19.6 percent of the total value of Unit 1 and 46.8 percent of that of Unit 4 are attributable to developable or agricultural opportunity, which constitutes the low and high parameters at which future spending estimates are reduced. Therefore, while SWCP anticipates spending \$500,000 to \$1.0 million each year through 2012, this chapter only considers \$402,000 to \$502,000 as direct conservation efforts.

4.4.2 THE NATURE CONSERVANCY

As discussed previously, TNC is involved in a three-way real estate transaction, where TNC will sell a 100-acre piece of land (the Noble Tract) to LPSNRD, and LPSNRD will sell it to SWCP after holding it in trust for one month. TNC cannot profit from this sale as decreed in its charter and intends to redistribute the proceeds in the form of \$30,000 annual grants between 2009 and 2014. This grant money is reserved for the conservation of the species and its habitat and, therefore, is considered a post-designation impact. Given the year-to-year basis on which these grants will be awarded, it is difficult to assign dollar amounts to specific projects or proposed designation units. Therefore, this analysis attributes these grants to each proposed designation unit based on acreage.

TNC is expected to spend \$1,000 to \$5,000 annually on routine habitat management efforts in perpetuity.⁶⁵ These activities include signage, fencing, minor restoration projects, and mowing, and will primarily occur in the Upper Salt Creek North habitat (Unit 1). Additionally, a retired biology professor volunteers 300 hours each year to pull invasive/noxious species and monitor the condition of the habitat.

⁶⁵ Personal communication with John Heaston, Project Director, Central Nebraska Project Office, The Nature Conservancy, January 31, 2007.

At a rate of \$14.85 per hour, the value of annual TNC volunteer time is approximately \$4,500.⁶⁶ This level of volunteer effort is anticipated to last through 2014.

4.4.3 LOWER PLATTE SOUTH NATURAL RESOURCES DISTRICT

LPSNRD will also realize revenues from the Noble Tract transaction. The LPSNRD is expected to receive approximately \$180,000 from the arrangement, and plans to use this money for future land acquisitions and compensation for conservation easements to private property owners. While LPSNRD could apply these revenues toward other conservation efforts not involving the Beetle, it is dedicated to spend the \$180,000 on saline wetlands conservation projects. Therefore, this money is considered a post-designation impact. LPSNRD is likely to spend \$60,000 annually for the three years immediately following the proposed designation (2008 to 2010). LPSNRD is also expected to spend \$2,000 to \$4,000 in annual management and general conservation activities (i.e. fencing).⁶⁷

4.5 SUMMARY OF IMPACTS

As presented in Table E-4 in Appendix E, the total pre-designation impacts of Beetle conservation are estimated to be approximately \$1.7 million (in 2007 dollars). Approximately 55 percent (\$953,000) of total past impacts are attributed to Little Salt Creek – Arbor Lake habitat (Unit 2), where SWCP initiated an extensive restoration effort in 2006. Total post-designation impacts are expected to be between \$4.6 and \$8.4 million in undiscounted dollars. In present value terms, the likely future economic impacts of the designation are estimated at \$3.8 to \$6.6 million (at three percent) and \$3.1 to \$5.0 million (at seven percent). In annualized terms, future conservation expenditures are anticipated to range between \$256,000 and \$443,000 (annualized at three percent) and \$291,000 to \$473,000 (annualized at seven percent). The post-designation impact estimates assume that SWCP spending will be dispersed to each unit on a per-acre of ownership basis. Given this assumption, the Jack Sinn – Rock Creek habitat (Unit 4) will realize the majority of the spending. Figure 4-1 presents the post-designation spending estimates on a per-unit basis. SWCP is expected to bear most of the impact (93 percent). Some of this impact is also anticipated to be borne by LPSNRD and TNC (four percent and three percent, respectively) (see Figure 3-1).

The majority of expected conservation costs/expenditures are attributed to SWCP. The Partnership, however, receives funding from a variety of public entities, NGOs, and special interest groups. SWCP expenditures constitute over 75 percent of past impacts and 90 percent of anticipated future impacts. Two members of SWCP, TNC and LPSNRD, are the other parties involved in substantial species conservation efforts. As presented in Figure 4-2, SWCP's initiatives are funded by Federal, state, and local

⁶⁶ The Independent Sector Organization, Value of Volunteer Time, "Dollar Value of a Volunteer Hour, by State: 2004", http://www.independentsector.org/programs/research/volunteer_time.html, accessed February 1, 2007.

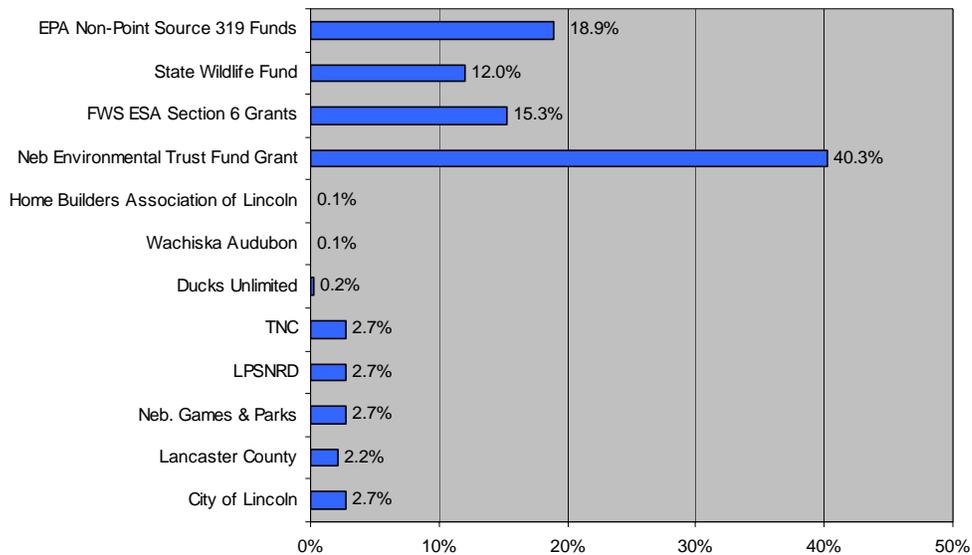
⁶⁷ Personal communication with Dan Schulz, Resource Coordinator, Lower Platte South Natural Resources District, January 25, 2007

governments, as well as non-profit organizations. More than 40 percent of these funds come from Nebraska Environmental Trust Fund Grant. Other major funding sources include EPA Non-Point Source 319 funds (19 percent), U.S. Fish and Wildlife Service ESA Section 6 grants (15 percent), and State Wildlife Fund (12 percent).

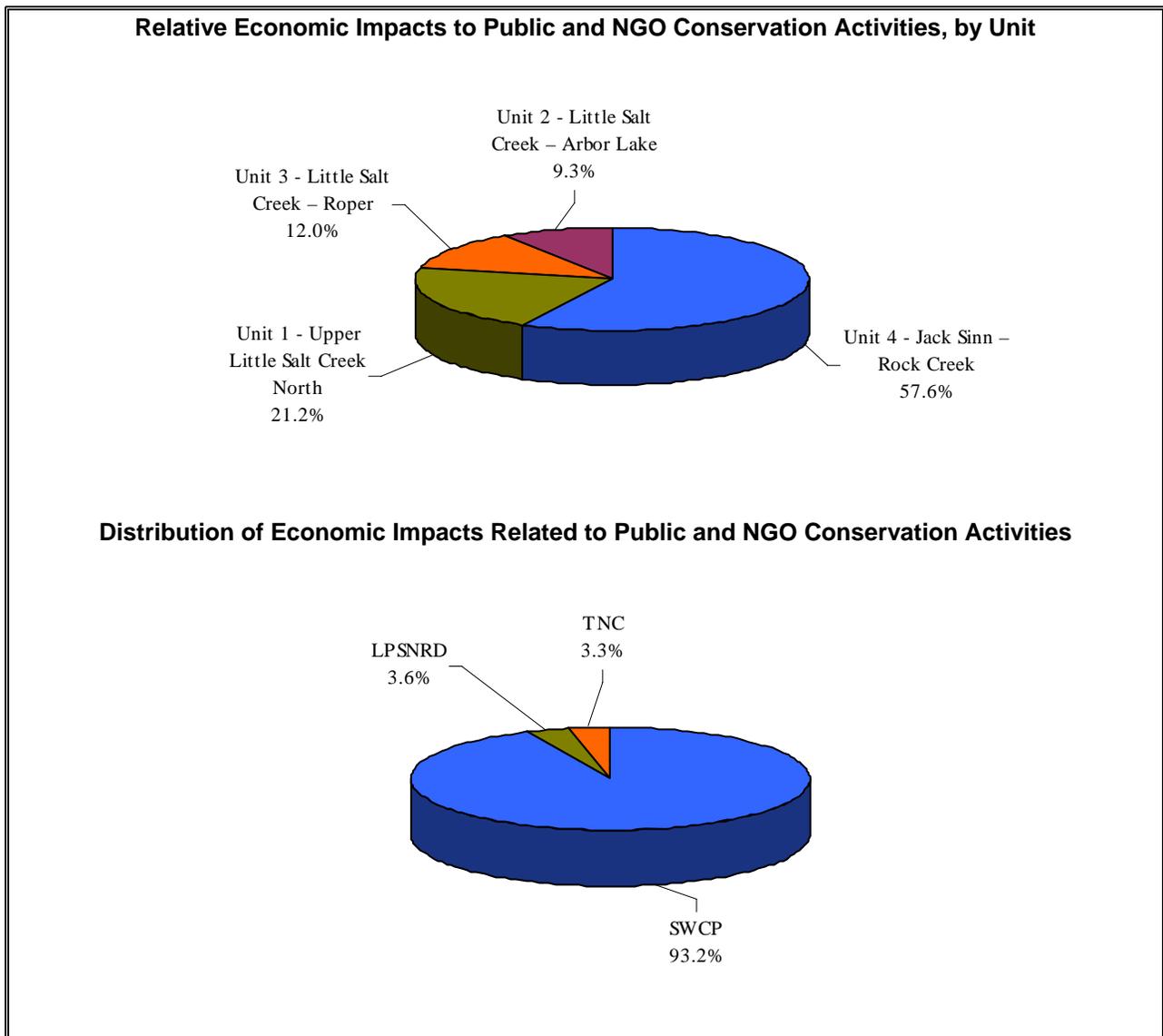
**Figure 4-1
SWCP Funding Sources**

SWCP is the primary party carrying out conservation efforts, but represents a concerted conservation approach from multiple organizations. Because SWCP spending constitutes the vast majority of conservation spending and is comprised of a mix of organizations, it is pertinent to review its funding sources. This study assessed all definite funding sources for the Partnership through 2008, including pre-listing monies, to best characterize SWCP's financial structure. Pre-listing funds are considered applicable as listing of the species did not significantly alter SWCP operations. Thus far, SWCP has relied upon Federal and state environmental grants to conduct conservation and restoration projects, which have comprised nearly 75 percent of SWCP's operating budget. The following figure illustrates SWCP's funding sources.

SWCP Funding, by Source (2002 to 2008)



**Figure 4-2
Economic Impacts to Public and NGO Conservation Activities**



4.6 CAVEATS

In order to quantify future impacts related to conservation efforts, this study observed trends in spending of relevant organizations to typify future conservation efforts, and worked closely with the appropriate parties to derive expected impact estimates. However, funding for proposed projects is undeterminable and uncertain due to unforeseen circumstances that can result in a redistribution of intended funding. To the extent that this analysis over or underestimates the impact to public and NGO conservation activities in the future, estimated costs may be over or understated.

This chapter describes the past and expected future economic impacts to agricultural activities in areas proposed as critical habitat for the Beetle. Specifically, this analysis estimates the direct and indirect economic impacts on farming and livestock grazing due to Beetle conservation activities. This chapter is divided into five sections. The first provides an overview of agricultural activities in areas proposed as critical habitat and a general discussion of how these may affect the species. Next is a description of recommended species conservation activities and the methods used to estimate the economic impacts that may stem from these. This is followed by discussions of past and future economic impacts to farming and grazing in the area. The final section presents a brief summary of impacts.

5.1 BACKGROUND

Agricultural activities contribute substantially to Nebraska's economy, with cash receipts from farm production equaling nearly \$12 billion in 2004. Most of this income is attributed to the five leading commodities; cattle and calves, corn, soybeans, hogs, and wheat. The livestock industry accounts for about 62 percent of the State's total agricultural cash receipts each year. Nebraska's 48,000 farms and ranches utilize 93 percent of the State's total land area.⁶⁸

According to the 2002 Agriculture Census data, there are 2,764 farms in the two counties containing the proposed critical habitat, Lancaster and Saunders, with total sales amounting to over \$249 million (in 2007 dollars). Forty-six percent of these farms produce oilseed and grains, while 14 percent conduct beef cattle ranching and farming operations. The average farm size is 279 acres in Lancaster County and 396 acres in Saunders County. Soybeans, corn for grain, and sorghum for grain are the main crops grown in the area.⁶⁹ Saunders and Lancaster counties rank number one and three in the State in soybean production, and number three and twenty-five in the production of corn for grain, respectively.⁷⁰ More than 81 percent of the farmland in Lancaster County is cropland and about 12 percent is pasture, while this proportion is 87 percent and seven percent in Saunders County. The crop growing season in the area

⁶⁸ Extrapolated from data by National Agricultural Statistics Service, 2005, "Nebraska State Agriculture Overview – 2005," and Nebraska Department of Agriculture, 2006, "Nebraska Agriculture – Fact Card."

⁶⁹ Personal communication with Buzz Vance, Certification/WPS Training, Pesticide Program, Nebraska Department of Agriculture, January 30, 2007.

⁷⁰ Nebraska Agricultural Statistics Service, 2002 Census of Agriculture, "County Profiles for Lancaster and Saunders Counties."

is from April to September⁷¹ and the grazing season lasts for five/six months, from May to September/October.

The proposed critical habitat mostly consists of saline wetlands and is not considered prime agricultural land.⁷² The salty nature and hydrology of the Salmo Silt Loam soil, which essentially makes up more than 90 percent of the habitat,⁷³ limits crop production as well as grazing.⁷⁴ Of the 82 percent of the area within the proposed critical habitat that is classified as agricultural land, almost 94 percent is pasture, while the remaining six percent is cropland.

The final listing rule identifies threats to the Beetle from agricultural activities within the habitat and surrounding areas.⁷⁵ While normal grazing does not harm the species or its habitat, trampling caused by over-grazing can result in substantial degradation or destruction of the habitat for both adult and larval forms of the species. Additionally, cattle-grazing tends to compact the soil and modify its hydrology, which can ultimately render it dry and unsuitable for the adult Beetle population as well as the larvae. Over-grazing in the surrounding areas can also negatively impact the habitat through sediment erosion from these lands that can change the topographic elevation of the habitat, thus making it incompatible for the Beetle. Sediment erosion can also be caused by cultivation within and in the vicinity of the habitat that can potentially cover larval burrows, change soil salinity, and encourage encroachment of harmful plant species. Further, in the absence of a vegetative buffer between the habitat and cropland, pesticides may be introduced into the saline wetland adjacent to the cultivated land. These can either directly impact the species or do so indirectly by harming its prey. Given the potential impacts of grazing and cultivation activities on the Beetle, it is prudent to outline and quantify measures that can potentially minimize these harmful effects in order to protect the species.

5.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

The analysis of agricultural impacts is based on the assumption and scientific opinion that while all levels of cultivation within and around the critical habitat has the tendency to take the Beetle and damage its habitat, grazing only harms the species if it is carried out beyond a certain threshold (i.e., over-grazed).⁷⁶ Species conservation activities, therefore, should include measures to minimize cropland within the

⁷¹ Nebraska Farm Bureau Federation, "A Look at Nebraska Agriculture," and Microsoft Encarta Online Encyclopedia, 2006, <http://encarta.msn.com>, accessed February 14, 2007.

⁷² Personal communication with Buzz Vance, Certification/WPS Training, Pesticide Program, Nebraska Department of Agriculture, January 30, 2007.

⁷³ This proportion is based on visual assessment of soil type maps of the four proposed critical habitat units.

⁷⁴ Personal communication with Dr. Bruce Anderson, Professor of Agronomy and Extension Forage Specialist, University of Nebraska at Lincoln, February 1, 2007.

⁷⁵ *Federal Register*, Vol. 70, No. 193, pp. 58335-58351, October 6, 2005.

⁷⁶ *Federal Register*, Vol. 70, No. 193, p. 58343, October 6, 2005.

habitat and reduce the harmful affects of farming from land cultivated in the surrounding areas. Additionally, these should ensure normal levels of grazing within and around the habitat, especially in areas where over-grazing is presently taking place. Finally, actions to protect the barren salt flats within the habitat are also necessary for the reproduction of the Beetle. Four distinct actions are anticipated to stem from the preceding discussion:

1. Create a buffer around the habitat to protect it from sediment and pesticides.
2. Convert all cropland within the habitat to pasture/grassland.
3. Impose grazing restrictions on pasture/grassland within the habitat and buffer.
4. Install fences around the barren salt flats within the habitat.

In order to quantify anticipated impacts to agriculture, the approach to estimating impacts associated with all these measures is presented in the following discussion. The expected low-range impact to agriculture includes impacts attributed to species conservation activities within the habitat, while the anticipated high-range impact takes into account the impacts associated with measures to protect the Beetle within the habitat as well as the suggested buffer.

5.2.1 CREATION OF APPROPRIATE BUFFER

“Conservation buffers are areas or strips of land maintained in permanent vegetation to help control pollutants and manage other environmental problems.”⁷⁷ The analysis assumes that buffers used to protect water bodies from pesticides and sediment in agricultural runoff could be used to shield the habitat from these elements. A study of the types of conservation buffers suggests that grass filter strips are most suitable for meeting the objectives.

The appropriate width of the buffer was determined following a review of literature and interviews with experts. Widths of buffers are generally based on soil type, slope, size of source area, intensity and quantity of rainfall, runoff flow rate and depth.⁷⁸ NRCS recommends a filter strip width of at least 20 ft. to reduce sediment, particulate organics, and sediment-absorbed contaminant loadings in runoff, while an additional width of 30 ft. is suggested to reduce dissolved contaminants in runoff.⁷⁹ The two sources used to determine the maximum width are the Continuous Conservation Reserve Program (CCRP) guidelines and the maximum filter strip width allowed under the Nebraska Buffer Strip Program (NBSP).⁸⁰ Both programs suggest a maximum width of 120 ft. Given the soil type and sensitivity of the

⁷⁷ Natural Resources Conservation Service, March 2000, “Conservation Buffers to Reduce Pesticide Losses.”

⁷⁸ Ibid.

⁷⁹ Natural Resources Conservation Service, Conservation Practice Standard – Filter Strip Code 393.

⁸⁰ Fox, Amanda, Tom Franti, and Mike Kucera, February 2005, “Planning your Riparian Buffer: Design and Plant Selection,” University of Nebraska – Lincoln Extension and Personal communication with Craig Romary,

species habitat to sediments and pesticides, a conservative approach is used, culminating in a buffer width of 120 ft. to protect the Beetle. Additionally, it is assumed that the filter strips around the habitat will be maintained through regular grazing, thus eliminating any potential maintenance impacts.

The analysis also examined the entities that may potentially bear the impact of creating the suggested buffers. As elaborated later in Section 5.4, this impact is anticipated to be shared by private landowners and NGPC. This determination was made after considering other Federal and state programs in the area that facilitate and encourage the protection of saline wetlands through monetary compensations and/or technical support. One such program is the NRCS' Wetlands Reserve Program (WRP) that offers the options of permanent and 30-year conservation easements, as well as minimum 10-year cost-share agreements. Based on the option selected, NRCS provides 75 to 100 percent of restoration costs and, in the case of conservation easements, 75 to 100 percent of appraised land values to the landowners. However, the program has not been very popular in past due to the method employed in land appraisal.⁸¹ The land appraisal process was revised in January 2006⁸² and there is enough funding available, but it is still unclear whether the program will receive a better response in the near future. Another program, the state managed NBSP, is funded through a fee assessed on pesticides registered in Nebraska, and provides compensation to landowners to establish buffer strips along vulnerable surface water resources in order to reduce sediments and other pollutants in runoff. This compensation roughly ranges between \$50 and \$150 per acre based on whether the land is irrigated or non-irrigated and if it is enrolled with another program.⁸³ While the program is fairly popular, it is likely to lose popularity as the commodity prices in the market are expected to increase with time and the limited compensation being offered by NBSP may

Environmental Protection, Nebraska Buffer Strip Program, January 30, 2007 and Nebraska Buffer Strip Program website, <http://www.agr.ne.gov/division/bpi/pes/buff.htm>, accessed January 30, 2007

⁸¹ Presently, there are only eleven WRP easements filed with landowners on approximately 720 acres in Lancaster County. The program has not been very popular with landowners in the past because the contracts were paid on the agricultural value of land and, thus, the landowners received a lower compensation than the market value of land. Due to its vicinity to the City of Lincoln, the land here has development value, which is higher than what the program was offering to landowners in the past. Personal communications with Randy Epperson, Wetlands Reserve Program, Nebraska Natural Resources Conservation Service, March 26, 2007 and March 30, 2007.

⁸² Under the new approach, the "whole property," or any similar or adjoining land to the offered easement area in which the applicant has ownership interest is appraised. The whole property appraisal leads to a "before easement value" and an "after easement value." Monetary offers to potential applicants are based on the difference in appraised value of the whole property before easement and that after the easement. Additionally, the residual value of this land, such as potential recreational uses for wildlife viewing and hunting, is subtracted from these offers. With the new approach, WRP hopes to get a better response from landowners. Personal communication with Randy Epperson, Wetlands Reserve Program, Nebraska Natural Resources Conservation Service, March 26, 2007.

⁸³ Presently, there is enough funding available to enroll the present applicants, but this funding is variable and subject to review every year. Personal communication with Craig Romary, Environmental Protection, Nebraska Buffer Strip Program, March 22, 2007.

not keep pace with the higher market prices of agricultural goods.⁸⁴ The length of the contract under this program is between 5 and 10 years, with no permanent option to conserve the land. Given the current and likely future situation of both WRP and NBSP, and the fact that NBSP does not offer any permanent solutions for protecting the Beetle, the analysis assumes that the impact of converting cropland to pasture/buffer will be borne by the private landowners and NGPC. There is a possibility that some more land may be enrolled in these programs, but that will not change the actual impact and merely transfer some of the impact to NRCS and/or NBSP.

5.2.2 CONVERSION OF CROPLAND TO PASTURE

There are two consequences of the conversion of cropland to pasture; the actual impact of conversion and the opportunity cost that manifests itself in lost land value. The latter is assumed to take place immediately following the designation, and is considered to include the lost agricultural returns due to the modified land use, since cultivated land has a higher per-acre income return for the landowner compared to grassland. This value is anticipated to be lost in perpetuity, representing a loss of opportunity to society. The conversion cost is expected to spread out over an eight-month period during 2008, the first crop year following final designation (estimated by year end 2007).

The Department of Agricultural Economics at the University of Nebraska tracks the agricultural market activity across the State annually through a cadre of nearly 150 land market observers. This information is compiled as the “UNL Nebraska Farm Real Estate Market Development Survey.”⁸⁵ In order to come up with a reasonable estimate of expected lost land values after the designation, the analysis uses the difference between the per-acre value of low grade “Dryland Cropland” (with no irrigation potential) and that of low grade “Grazing Land” within the Eastern District of Nebraska, which includes Lancaster and Saunders counties. The decision to use values of low grade land is based on the general quality of soil within the habitat and 120 ft. buffer.

The anticipated per-acre actual cost of converting cropland to pasture is derived from two reports by the University of Nebraska – Lincoln Extension. Data provided for the Eastern District (which includes Lancaster and Saunders counties) in the “2006 Nebraska Farm Custom Rates – Part I”⁸⁶ are used to calculate expected labor and machinery costs of disk harrowing, cultivating grass seed, and spreading fertilizer. The potential costs associated with rolling, the anticipated cost of material such as grass seed

⁸⁴ Personal communication with Craig Romary, Environmental Protection, Nebraska Buffer Strip Program, March 22, 2007.

⁸⁵ Johnson, Bruce B., Ben Blomendahl, and Kyle Overturf, June 2006, “Nebraska Farm Real Estate Market Developments 2005-2006,” University of Nebraska – Lincoln Extension.

⁸⁶ Jose, H. Douglas and Sarah Malchow, 2006, “2006 Nebraska Farm Custom Rates – Part I,” University of Nebraska – Lincoln Extension.

and fertilizer, and the expected overhead and management costs are determined based on the budget for establishing grassland presented in the “Nebraska Crop Budgets – 2006.”⁸⁷

5.2.3 GRAZING RESTRICTIONS

As stated in the preceding discussions, normal grazing within and around the Beetle habitat does not result in the take of the species. This economic analysis assumes that the prudent landowner will manage land to maximize returns, and will avoid over-grazing in order to maintain the long-term health and productivity of the pasture. Therefore, this analysis stops short of quantifying the expected impacts associated with reduced grazing.

5.2.4 PROTECTION OF BARREN SALT FLATS

The salt and moisture content in barren salt flats provide the ideal environment for Beetle reproduction activities. However, trampling caused by over-grazing tends to change the hydrology of these areas, making them unsuitable for the species. The barren salt flats present in the habitat vary in size from approximately eight square feet to a few acres, and are scattered throughout the area.⁸⁸ Installing fences around these patches may be a cost-efficient way to protect them from hoof-action. The University of Nebraska estimates the cost of a barbed wire fence (with four strands and two H-braces) at \$1.04 per ft., and that of a high tensile wire fence (with four strands and two H-braces) at \$1.10 per ft. including the energizer (in 2007 dollars).⁸⁹ These estimates are based on quarter mile long fence costs and may vary depending on the shape of the area to be fenced and the total length of fence required. Due to limited information regarding the sizes, shapes, and locations of these barren salt flats within the saline wetlands that comprise the proposed designation, the fencing costs are not quantified in the analysis. Considering the small land area and dispersed locations of these barren salt flats and the low cost of fencing, fencing costs to protect the Beetle are expected to be very minor.

5.3 PAST ECONOMIC IMPACTS

There are no past economic impacts associated with agriculture, since no species conservation activities directly related to grazing or cultivation have been carried out since federal listing of the Beetle in 2005.

⁸⁷ Selley, Roger A. Tina Barrett, and Robert Klein, 2006, “Nebraska Crop Budgets – 2006,” University of Nebraska – Lincoln Extension.

⁸⁸ Personal communication with Tom Malmstrom, Coordinator/Director, Saline Wetlands Conservation Partnership, January 26, 2007.

⁸⁹ Wilson, Roger K., and Richard T. Clark, 2006, “Costs of Cattle Fencing for Grazing Areas,” University of Nebraska – Lincoln Extension.

5.4 FUTURE ECONOMIC IMPACTS

As implied in previous discussions, two components of anticipated future economic impacts are quantified in the analysis; the lost value of land following the change in land use from cropland to pasture, and the cost associated with the physical conversion of this land to pasture.

5.4.1 LOST VALUE OF AGRICULTURAL LAND

The per-acre value of low grade “Dryland Cropland” in the Eastern District of Nebraska is estimated to be \$1,760, while that for low grade “Grazing Land” in the area is \$715 (in 2007 dollars).⁹⁰ As stated previously, the lost value of agricultural land following the designation is calculated as the difference between the value of cropland and that of pasture. Based on the University of Nebraska estimates, the value of the land within and around the proposed habitat will likely depreciate by \$1,045 per acre (in 2007 dollars) when the use is changed from cultivation to grazing. This loss in value is anticipated to occur immediately following the designation.

Table 5-1 presents the current agricultural land use within the habitat and the suggested 120 ft. buffer for land owned by private parties. Of the 824 acres of privately owned agricultural land within the proposed designation, 72 acres (nine percent) is classified as cropland, while 752 acres (91 percent) is pasture. When the area within the 120 ft. buffer is added, the cropland increases to 200 acres (15 percent) and pasture to 1,170 acres (85 percent), for a total of 1,370 acres of privately owned agricultural land. The only other landowner that may be affected by this devaluation is NGPC, which owns about seven acres of cropland within the habitat and ten acres in the buffer.⁹¹ This land is mostly in the upland sites and is already being managed to restore the hydrology and maintain suitable conditions for all the species that inhabit it. In addition to rotational management of crops, chemical use is restricted to the minimum required levels.⁹² However, based on the assumption that after the designation all landowners would take necessary steps to avoid take of the Beetle, the lost land value and physical cost of conversion are also applied to NGPC land.

Thus, in terms of impact, private landowners are expected to incur losses ranging between approximately \$86,000 and \$240,000 in undiscounted dollars. The anticipated cost to NGPC is estimated to range from approximately \$9,000 to \$19,000 in undiscounted dollars.

⁹⁰ Johnson, Bruce B., Ben Blomendahl, and Kyle Overturf, June 2006, “Nebraska Farm Real Estate Market Developments 2005-2006,” University of Nebraska – Lincoln Extension.

⁹¹ Personal communication with Ted Lagrange, Wetlands Specialist, Nebraska Game and Parks Commission, February 12, 2007.

⁹² Personal communication with Chuck Lesiak, Land Manager (Grazing), Nebraska Game and Parks Commission, February 15, 2007.

Table 5-1
Private Agricultural Land Use within Proposed Critical Habitat and 120 ft. Buffer

	Cropland (Acres)	Pasture (Acres)	Total (Acres)	% Pasture
Proposed Designation	72	752	824	91%
Buffer	128	418	546	77%
Total (Proposed Designation + Buffer)	200	1,170	1,370	85%

5.4.2 COST OF CONVERSION OF CROPLAND TO PASTURE

Table 5-2 presents a detailed cost estimate for establishing a pasture in Nebraska. The cost components include field operation costs (labor and machinery), material costs, overhead, management costs, and interest on capital. The budget assumes that if landowners convert their cropland to pasture in order to avoid take of the species, hired labor will be used for the purpose. The per-acre impact of this conversion is anticipated to be \$151.88 (in 2007 dollars). Given the 72 acres of private cropland within the habitat and 200 acres including the buffer, the conversion cost to private landowners is expected to range from approximately \$11,000 to \$30,000 in undiscounted dollars. The cost to NGPC is anticipated to vary between \$1,000 and \$2,000 in undiscounted dollars, approximately, based on seven acres of cropland in the proposed habitat and 16 acres including the proposed habitat and buffer.

**Table 5-2
Crop Budget for Establishing a Pasture (in 2007 dollars)**

Cost Category	Cost per Acre
Field Operation	
Custom Disc	\$9.14
Custom Field Cultivation / Drill	\$9.86
Roll	\$5.46
Spread Fertilizer	\$5.39
Sub-Total Field Operations	\$29.85
Materials	
Grass Seed (60 lbs.)	\$85.80
Fertilizer 11-52-0	\$10.20
Sub-Total Materials	\$96.00
Other Costs	
Interest on Operating Capital	\$5.03
Overhead	\$6.00
Management	\$15.00
Sub-Total Other	\$26.03
Total Costs	\$151.88

Sources: Jose, H. Douglas and Sarah Malchow, 2006, "2006 Nebraska Farm Custom Rates – Part I," University of Nebraska – Lincoln Extension and Selley, Roger A. Tina Barrett, and Robert Klein, 2006, "Nebraska Crop Budgets – 2006," University of Nebraska – Lincoln Extension.

5.5 SUMMARY OF IMPACTS

Table E-5 in Appendix E provides a summary of agriculture-related impacts that are anticipated to occur (post-designation) due to the critical habitat designation of the Beetle. There are no pre-designation impacts between 2005 and 2007 associated with farming and grazing. Following the designation, approximately \$95,000 to \$259,000 in post-designation agricultural impacts are forecast in undiscounted dollars, or \$95,000 to \$258,000 and \$95,000 to \$256,000 in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated to range between at \$7,000 and \$17,000 (at three percent) and between \$9,000 and \$23,000 (at seven percent) (in 2007 dollars).

More than 84 percent of the potential post-designation agricultural impacts within the critical habitat and over 79 percent of these impacts within the 120 ft. buffer boundary are forecast to occur in Unit 4, or 81 percent within the critical habitat and buffer (see Figure 5-1). In terms of land ownership, private

landowners are expected to bear approximately 93 percent of these impacts (see Figure 5-1). The remaining impacts are anticipated to be borne by NGPC.⁹³

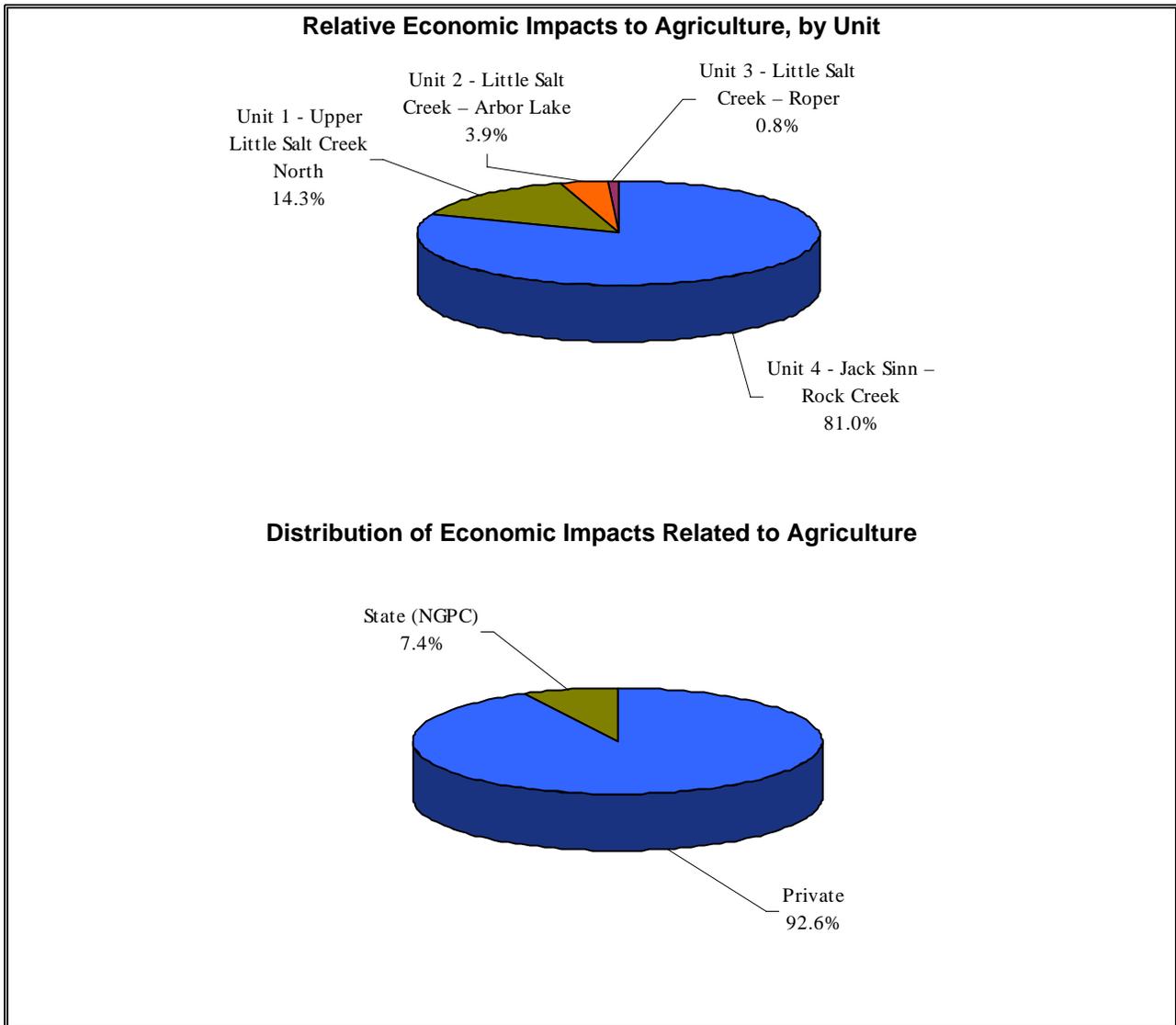
5.6 CAVEATS

Given the soil type and sensitivity of the species habitat to sediments and pesticides, the 120-foot buffer suggested to protect the Beetle and its habitat is based on a conservative approach using the maximum allowable width under two programs, the CCRP and Nebraska Filter Strip Program. Factors affecting the buffer width, such as soil type, slope, size of source area, intensity and quantity of rainfall, runoff flow rate and depth, were not considered for each part of the habitat individually. Depending on these factors, the required width of the buffer may vary in reality. Additionally, it is assumed that the filter strips around the habitat will be maintained through regular grazing, thus eliminating any potential maintenance impacts. To the extent that this analysis over or underestimates the impacts of these efforts in the future, estimated costs may be over or understated.

Further, this economic analysis assumes that the prudent landowner will manage land to maximize returns, and will avoid over-grazing in order to maintain the long-term health and productivity of the pasture. Therefore, while this analysis identifies a suitable stocking rate based on the soil type and vegetation that would minimize over-grazing, it stops short of quantifying the potential impacts associated with reduced grazing.

⁹³ State and federal conservation programs are available that compensate landowners for participation in the establishment of buffer strips and permanent habitat protection (e.g., USDA Natural Resources Conservation Service Wetland Reserve Program and Nebraska Buffer Strip Program). Should some of the landowners enroll their land in these programs, then their impact would be born by the federal or State government. In this scenario, impacts to private landowners would be overstated; however, total impacts would not change.

**Figure 5-1
Economic Impacts to Agriculture**



This chapter details the impacts to past and future transportation and public works projects associated with the proposed designation. Modifications of existing projects and construction of new utilities and roads in and around the City of Lincoln can potentially be affected by the designation. While this chapter examines transportation projects at the city, county, and state levels, public works and utility projects within the City of Lincoln are included in the analysis. The chapter is divided into five sections. The first presents the background of transportation and public works in the proposed habitat. Next is a description of the approach used to estimate potential impacts. The following two sections present the past and future economic impacts. Finally, the last section presents a brief summary of these impacts.

6.1 BACKGROUND

The City of Lincoln is anticipating expansion towards the north, near the Little Salt Creek – Roper habitat (Unit 3) (see Figure 6-1). Utility development in the area, as a consequence of this growth, is expected to be affected by the proposed designation. In addition, multiple transportation projects, aimed at facilitating the flow of traffic on nearby interstates, are in various stages of planning and development. The following paragraphs provide a discussion of projects currently underway in the area, as well as those expected over the next 20 years, that may possibly be affected by Beetle conservation.

6.1.1 BACKGROUND OF TRANSPORTATION AND PUBLIC WORKS IN THE AREA

Formal discussions regarding a roadway-system encircling the City of Lincoln, have been underway over the past forty years. The project is expected to improve the flow of interstate traffic as it increases due to the continued growth in the area. The East Beltway (of the roadway-system) will connect Interstate-80 (I-80) to Nebraska Highway 2, while the South Beltway will link Nebraska Highway 2 to US-77.⁹⁴ No portions of the East and South Beltways are in the Beetle habitat.⁹⁵ The West Beltway, which is almost completed and will upgrade US-77 to freeway standards,⁹⁶ is also not in the proposed designation.⁹⁷ Interstate-80 is anticipated to provide the most important link on the northern side of the City,⁹⁸ and is

⁹⁴ Nebraska Department of Roads, April 2001, “Draft EIS for South and East Beltways Lincoln, Nebraska.”

⁹⁵ Personal communication with Toby Fierstein, 1/9 Project Engineer, Nebraska Department of Roads, January 9, 2007.

⁹⁶ Nebraska Department of Roads, “Lincoln West Beltway,” www.nebraskatransportation.org/projects/linc-w-beltway/index.htm, accessed January 9, 2007.

⁹⁷ Personal communication with Syed Ataullah, Consultant Coordinator, Nebraska Department of Roads, January 9, 2007.

⁹⁸ Nebraska Department of Roads, April 2001, “Draft EIS for South and East Beltways Lincoln, Nebraska.”

presently undergoing an ongoing construction to widen the Highway to six lanes. The I-80 Bridge over Little Salt Creek is being widened in two phases, with the westbound bridge broadened first, followed by the eastbound bridge.

Lancaster County's "Six-Year Capital Improvement Plan" has several proposed highway improvements that are in the proposed designation.⁹⁹ Three bridges along Little Salt Creek, namely C172, C91, and F88, are in need of replacement. Though these bridges are identified for replacement during the next six years, it is likely that they will not be replaced within that time frame.¹⁰⁰ However, these bridges will need to be replaced sometime in the next 20 years. Therefore, this analysis assumes the bridges will be replaced during the 15-year timeframe (i.e., 2013 to 2027) following the period covered by the Six-Year Capital Improvement Plan (2007 to 2012). In addition, the F197 Waverly Bridge may need to be repaired, though it is new and the requirement is not indicated in the Plan. The Plan also includes paving two miles of Arbor Road. Maintenance of the bridges and roads, though not included in the Plan, will have additional economic affects. The types and extent of these impacts, however, are not yet understood. The Plan also includes many projects that will not be accomplished over the six-year period due to lack of sufficient funds required for all of the upgrades.¹⁰¹

The City of Lincoln Department of Public Works and Utilities anticipates future growth in the Little Salt Creek drainage area. In order to service this development, utilities are already slated for the area. Installation of a water main will be required to provide the area with public water access, and wastewater will be served from existing trunk sewer lines east and west of the saline wetlands. The facility master plan also suggests serving the greater Little Salt Creek area north of I-80 with sewer lines.¹⁰²

In addition to the above ongoing and planned developments, Lincoln Electric System is constructing 20 miles of high voltage power lines north of the City of Lincoln. The project is called the Northern Tier Transmission Line Project (NTTLP), and the first phase of construction on the line was expected to commence in January, 2007. The 345V transmission line will directly service 123,000 electric customers in the City and surrounding area, while also indirectly servicing all Lincoln Electric System customers through increased reliability by completing a high voltage bulk transmission loop around the City. The NTTLP, which has been formally discussed since 1999, is expected to be completed by the end of 2008.¹⁰³

⁹⁹ City of Lincoln Nebraska, 2007, Lancaster County Road and Bridge Construction Program in Capital Improvement Program." <http://www.lincoln.ne.gov/cnty/engin/pdf/newone.pdf>

¹⁰⁰ Personal communication with Virgil Dearmont, Civil Engineer, Lancaster County, February 5, 2007.

¹⁰¹ Ibid.

¹⁰² Personal communication with Steve Masters, Public Utilities Administrator, Lincoln Department of Public Works, February 15, 2007.

¹⁰³ Personal Communication with Dan Pudenz, V.P. of Engineering, Lincoln Electric System, December 22, 2006.

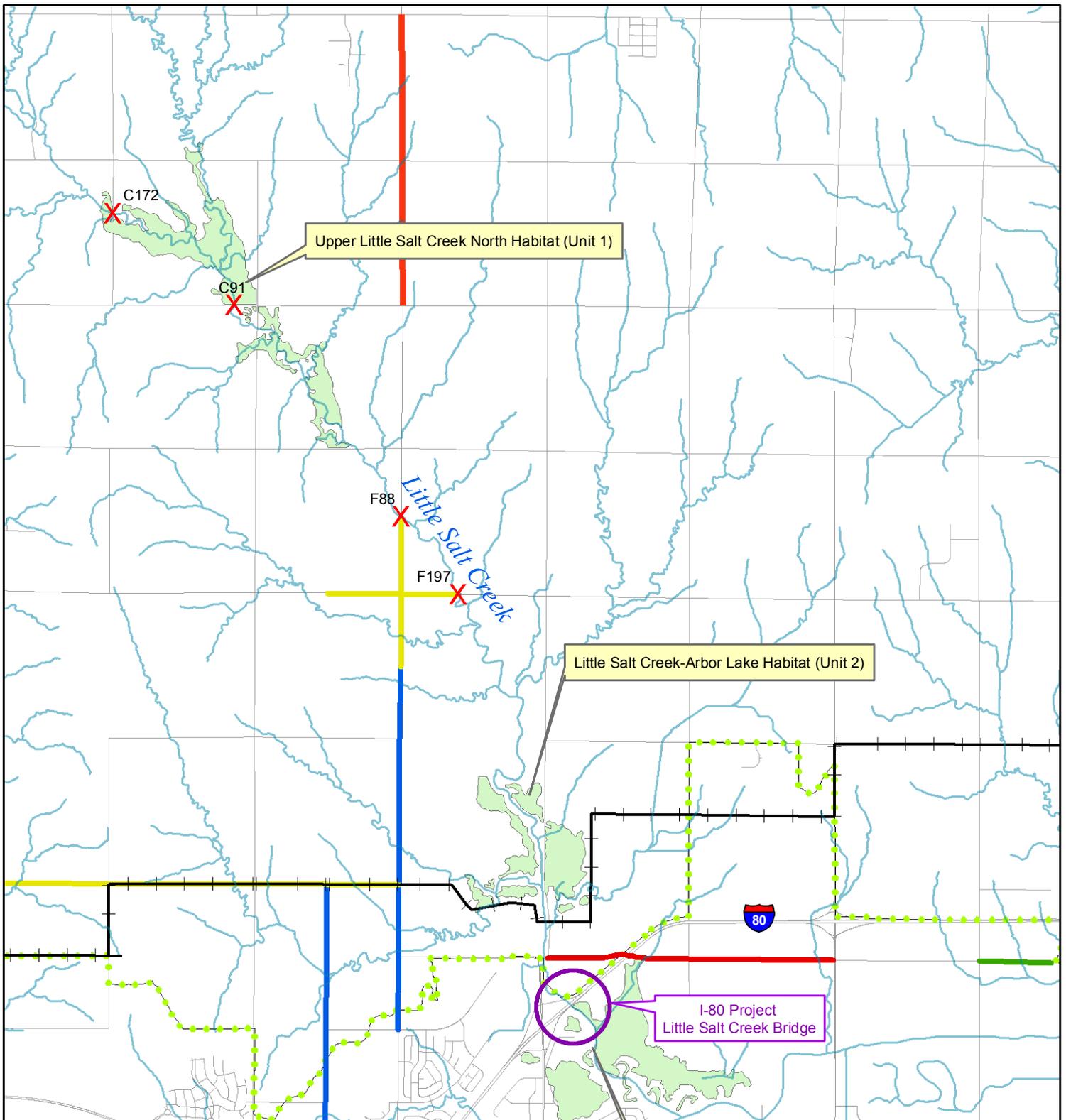


Figure 6-1
Transportation and Utilities

Proposed Transportation Improvements
Fiscal Years 2007-2012

- Paving
- Grading
- Engineering
- Right of Way
- X Bridges

- NTTLP
- Roads
- Future Service Limit (2030)

0 0.5 1 Miles

ENTRIX



I-80 Project
Little Salt Creek Bridge

Upper Little Salt Creek North Habitat (Unit 1)

Little Salt Creek-Arbor Lake Habitat (Unit 2)

Little Salt Creek-Roper Habitat (Unit 3)

Little Salt Creek



6.2 OVERVIEW OF APPROACH TO ESTIMATING IMPACTS

In order to estimate the potential impacts of the proposed designation on transportation and public works projects, this analysis relies on expert opinion. Officials from the NDOR, Lancaster County, Lincoln Department of Public Works and Utilities, Lincoln Electric System, U.S. Army Corps of Engineers, and the Federal Highway Administration were consulted to estimate the impacts associated with the critical habitat designation. Three main projects associated with growth in the City of Lincoln and surrounding areas are expected to be impacted by the proposed designation: 1) The widening of I-80 north of the City of Lincoln to improve the flow of interstate traffic in the area; 2) Utility development to meet the requirements in the Little Salt Creek area; and 3) Installation of a high voltage transmission line to increase the reliability of power around the City Lincoln. Bridge and road maintenance by the County is also anticipated over the next 20 years, though much of it is in rural areas and, thus, not attributable to urban growth. The potential economic impacts of the designation on these projects are estimated by officials from the relevant agencies. When the agencies could not provide an estimate, a benefit transfer is completed creating a reliable estimate of the affect of the proposed designation on the project.

6.3 PAST ECONOMIC IMPACTS

Past impacts include impact of species conservation activities to projects occurring between October 2005 and the end of 2007. There are two major projects that have either been completed or are underway between this time-frame. The I-80 Bridge widening projects are expected to conclude in 2007, while construction on the NTTLP commenced in January of 2007 and is expected to finish by the end of 2008. Thus, anticipated impacts associated with the NTTLP will be split between past and future impacts, though the project will only be discussed in this section to avoid repetition.

The widening of I-80 over Little Salt Creek is part of an ongoing project to improve the flow of interstate traffic in the area. Mitigation measures have already been undertaken during bridge construction due to the presence of Beetle habitat. In the pre-listing period, a temporary shoring wall to prevent soil from eroding into Little Salt Creek was erected. Measures during the pre-designation period include erecting a temporary Westbound Bridge for the movement of construction equipment at a cost of \$200,000, instead of employing a causeway at a cost of \$10,000 as per the usual practice.¹⁰⁴ Additionally, a part-time compliance contractor was hired for two years for a total of \$24,000 to monitor erosion control, etc. at the project site.¹⁰⁵ The Eastbound Bridge also required a temporary shoring wall, un-armoring of the bank, and a bridge pier extension, which also occurred pre-listing. Three silt fences each on the West and

¹⁰⁴ Personal Communication with Cindy Veys, Project Development, Nebraska Department of Roads, February 20, 2007.

¹⁰⁵ Ibid, March 23, 2007.

Eastbound bridges were erected to keep debris out of Little Salt Creek.¹⁰⁶ Though silt fences are often used on such projects, the economic analysis attributes the three fences on each bridge mentioned here to the Beetle. The fencing cost \$6,965 for 1,549 feet of high porosity fencing and 867 feet of low porosity fencing. An additional \$150 was required for designing of the fences by engineering.¹⁰⁷

Originally, a wide median was proposed for this project, which cannot be used due to the presence of Beetle habitat at the project site. Therefore, a concrete barrier median is used that involves greater construction costs compared with the wide median, thus adding to the impacts.¹⁰⁸ About one mile of drainage in the median of I-80 and a culvert system to the side of the Eastbound Bridge were redesigned to avoid drainage into Salt Creek.¹⁰⁹ These modifications were undertaken pre-listing, so costs for these activities will not be included in this analysis.¹¹⁰ The project will also use low mass lighting instead of the standard lighting since the species is attracted to standard lights.¹¹¹ Bidding for the widening of the I-80 interchange US-77 (east intersection) will begin in June 2007.¹¹² While this interchange is located more than one mile west of the proposed critical habitat, beetle-related conservation measures are expected to include erosion control measures and restricted construction hours.¹¹³ However, because the project occurs outside the proposed designation, potential impacts for the project will not be included in this analysis.

As discussed previously, the NTTLP line was included in Lincoln Electric System's "1999 Capital Improvement Program" commencing in 1999, though construction on the project did not begin until 2007. The project will complete a loop of high voltage bulk transmission lines around the City of Lincoln, ensuring more dependable service for the area, and is expected to cost close to \$6.5 million. The NTTLP line avoids saline wetlands in the Little Salt Creek - Arbor Lake area (Unit 2), and no facilities are proposed within the proposed habitat in the future. The route taken by the NTTLP is the least cost option, though an option through the habitat was never evaluated. Lincoln Electric System estimates that close to \$486,000 in additional direct construction costs can be attributed to the presence of the species in

¹⁰⁶ Personal Communication with Terry Gibson, Assistant Roadway Design Engineer, Nebraska Department of Roads, February, 22, 2007.

¹⁰⁷ Ibid.

¹⁰⁸ Personal communication with Ed Kosola, Federal Highway Administration, January 9, 2007.

¹⁰⁹ Personal Communication with Cindy Veys, Project Development, Nebraska Department of Roads, January 11, 2007.

¹¹⁰ Personal Communication with Terry Gibson, Assistant Roadway Design Engineer, Nebraska Department of Roads, February 22, 2007.

¹¹¹ Personal communication with Ed Kosola, Federal Highway Administration, January 9, 2007.

¹¹² Personal Communication with Mark Traynowitz, District Construction Engineer, Nebraska Department of Roads, January 9, 2007.

¹¹³ Personal Communication with Keith Tillotson, U.S. Army Corps of Engineers, December 15, 2006.

the area. Additional costs due to overhead time, administrative time, staff time, schedule time, and public review time can also be attributed to the Beetle, but were not estimated by Lincoln Electric System.¹¹⁴

6.4 FUTURE ECONOMIC IMPACTS

Future impacts of the proposed designation include those anticipated to occur between 2008 and 2027. These potential impacts include construction of bridges and utility facilities. Future economic impacts also include half of the cost of NTTLP, discussed previously. While this project is included in the analysis, it is not discussed in this section for brevity and to avoid repetition.

There are four bridges on Little Salt Creek that may be impacted by the critical habitat designation. Three of these are included in Lancaster County's "Six-Year Capital Improvement Plan,"¹¹⁵ because they should be replaced within the next six years, though it is likely that construction on the new bridges will not begin within the six year timeframe. The plan is a 'wish list' of projects that should be undertaken in the next six years, though there is not enough funding to carry out all of the projects proposed in the plan.¹¹⁶ The bridges will, however, need to be replaced within the next 20 years. The first bridge, named C172, is a low volume road that services about ten vehicles a day on average. It is primarily used by farmers in the area. In 2006, the decking planks and stringer were replaced on the bridge with no impact on the surrounding habitat. The second, C91, is located 250 ft. outside of the proposed designation, but may require special management and attention during construction to avoid affecting the Beetle habitat downstream. The bridge was repaired in 2006, but will need to be replaced within the next 20 years. The F88 Bridge over 14th Street is an old bridge that needs replacement, but has not received any repairs in the recent past. The final bridge (F197) that requires replacement does not appear in the Plan, since it is a fairly new bridge that is encountering some problems. Two proposed road work plans, a proposed intersection at 14th Street and Waverly Road and paving on Arbor Road, are not expected to be affected by the proposed designation.¹¹⁷

In order to value the expected impact of the designation on County bridge construction projects, the analysis relies on the findings of species conservation activities on the I-80 bridge, since no information is available on the future cost of species conservation activities on County bridge projects. The Westbound I-80 bridge-widening project cost \$1.4 million,¹¹⁸ and the Eastbound I-80 bridge widening project cost

¹¹⁴ Personal Communication with Dan Pudenz, V.P. of Engineering, Lincoln Electric System, December 22, 2006.

¹¹⁵ City of Lincoln Nebraska, 2007, Lancaster County Road and Bridge Construction Program in Capital Improvement Program." <http://www.lincoln.ne.gov/cnty/engin/pdf/newone.pdf>

¹¹⁶ Personal communication with Virgil Dearmont, Civil Engineer, Lancaster County, February 5, 2007.

¹¹⁷ Ibid.

¹¹⁸ Nebraska Department of Roads, 2002, "Lincoln City/Lancaster County, Nebraska: Transportation Improvement Program." <http://www.lincoln.ne.gov/city/plan/mpo/tip/tip03/pdf/state.pdf>.

\$775,000,¹¹⁹ or \$2.18 million in total. The cost of the I-80 Little Salt Creek Bridge widening project without the Beetle's impact would have been \$1.85 million.¹²⁰ Thus, Beetle conservation activities potentially add 17 percent to the cost of the bridge.

This 17 percent can be applied to the cost of the proposed bridges in the "Capital Improvement Plan."¹²¹ Bridge C91 has an estimated cost of \$262,000, bridge C172 has an estimated cost of \$153,800, and Bridge F88 has an estimated cost of \$501,700. Using these estimated costs for replacement, an average of \$305,000 can be applied to estimate the potential cost of replacement for bridge F179, which is not included in the plan. Using 17 percent as the expected impact of Beetle protection, the analysis suggests potential impacts of \$45,000, \$26,000, \$85,000, and \$52,000, respectively, for each bridge. Thus, the total anticipated impact of Beetle conservation activities on county bridges in the vicinity of the proposed designation is \$208,000, which is expected to occur between six and 20 years from present.¹²²

The anticipated development towards the north of Lincoln will need to be serviced by water and wastewater lines. The City of Lincoln Department of Public Works and Utilities will be required to install an approximately one mile long 16-inch water main from 27th Street to 40th Street north of I-80 in order to avoid disturbing the Beetle habitat while providing customers with water. This extra mile of pipeline will not service customers, nor provide any beneficial service, so the entire cost can be attributed to the proposed designation. This cost is expected to range from \$650,000 to \$750,000 between six and 15 years from now.¹²³ The wastewater lines required to service the area will come from trunk lines to the east and west of Little Salt Creek, and will not come into contact with the Beetle habitat. Construction of these wastewater lines are anticipated to occur between six and 15 years from now. Additionally, within the next 50 years, wastewater lines are expected to be extended farther into the Little Salt Creek basin. Two such lines are expected to service the area, which will avoid any contact with the habitat.

6.5 SUMMARY OF IMPACTS

Table E-6 in Appendix E provides a summary of transportation- and utility-related impacts that are anticipated to occur due to the critical habitat designation of the Beetle. The pre-designation impacts are quantified as \$464,000 between 2005 and 2007 (in 2007 dollars). Following the designation,

¹¹⁹ Nebraska Department of Roads, 2006, "Lincoln City/Lancaster County, Nebraska: Transportation Improvement Program." <http://www.lincoln.ne.gov/city/plan/mpo/tip/tip07/pdf/sectiona.pdf>

¹²⁰ Personal Communication with Terry Gibson, Assistant Roadway Design Engineer, Nebraska Department of Roads, February 20, 2007.

¹²¹ City of Lincoln Nebraska, 2007, Lancaster County Road and Bridge Construction Program in Capital Improvement Program." <http://www.lincoln.ne.gov/cnty/engin/pdf/newone.pdf>

¹²² Personal communication with Virgil Dearmont, Civil Engineer, Lancaster County, February 5, 2007.

¹²³ Personal communication with Steve Masters, Public Utilities Administrator, Lincoln Department of Public Works, February 15, 2007.

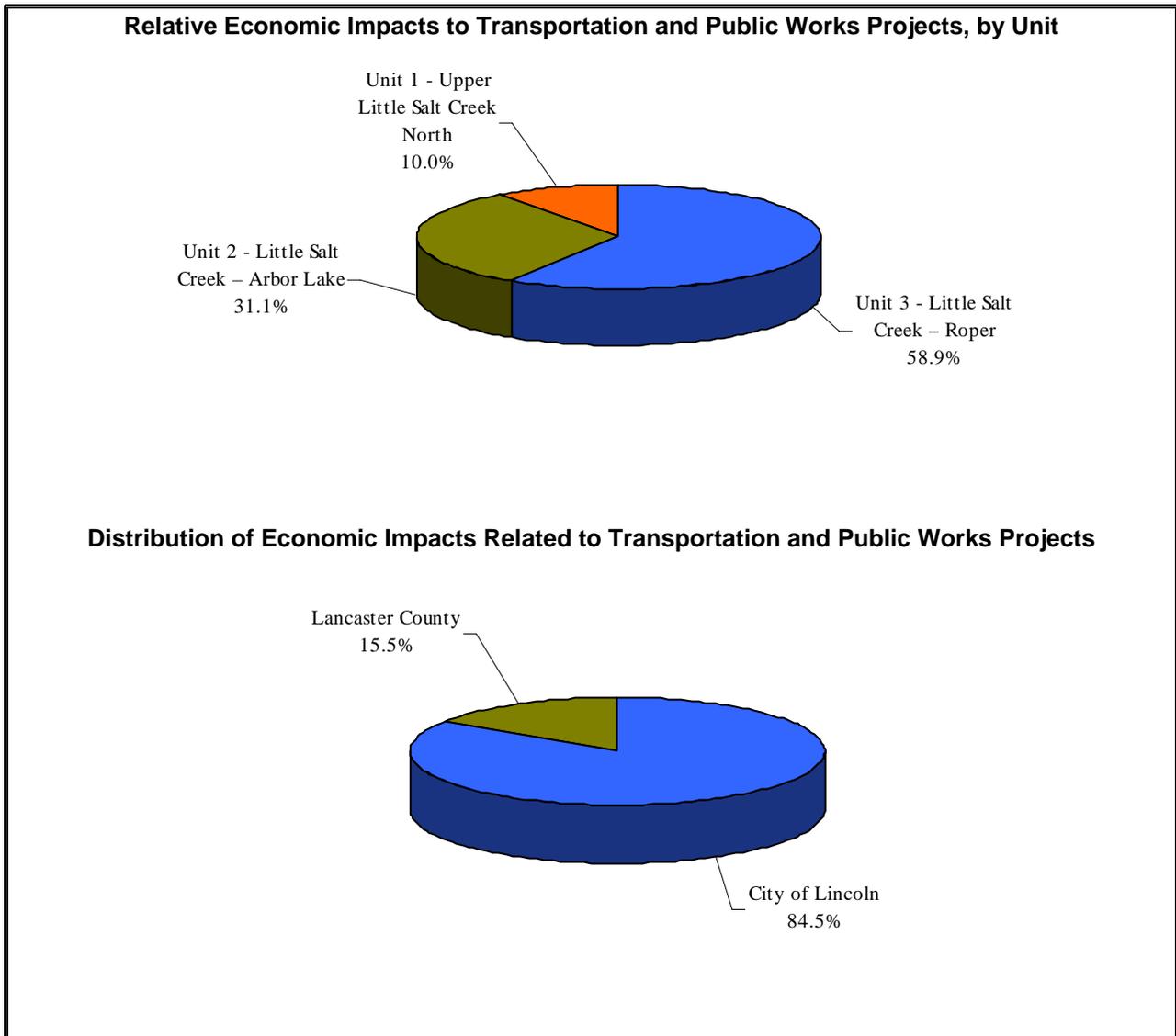
approximately \$1.1 to \$1.2 million in post-designation public utility and transportation impacts are forecast in undiscounted dollars, or \$850,000 to \$922,000 and \$631,000 to \$679,000 in present value terms at discount rates of three and seven percent, respectively. Expected annualized impacts are estimated to range between at \$57,000 and \$62,000 (at three percent) and between \$59,000 and \$63,000 (at seven percent) (in 2007 dollars).

About 59 percent of the post-designation impacts are anticipated to occur in Unit 3, followed by Unit 2 and Unit 1 that are forecast to bear 31 percent and 10 percent of these impacts, respectively (see Figure 6-2). In terms of distribution of these impacts, the City of Lincoln is expected to bear approximately 85 percent of these impacts, while the remaining are likely to be borne by Lancaster County (see Figure 6-2).

6.6 CAVEATS

The analysis performs a benefit transfer in order to value the anticipated impact of the designation on the bridge construction projects. Beetle conservation activities add 17 percent to the cost of the I-80 Bridge, and this 17 percent is applied to the cost of the proposed bridges in the “Capital Improvement Plan” to come up with potential impacts of Beetle conservation efforts. This assumption may not provide exact estimates, but is considered the best possible way to estimate expected future impacts. To the extent that this analysis over or underestimates the cost associated with these county bridges in the future, estimated impacts may be over or understated.

Figure 6-2
Economic Impacts to Transportation and Public Works Projects



This appendix presents administrative costs of actions taken under Section 7 of the Act associated with the geographic area proposed as critical habitat for the Beetle. First, this Appendix defines the types of administrative costs likely to be associated with the proposed habitat. Next, the Appendix presents estimates of the number of technical assistance efforts and consultations expected to result from the designation of critical habitat and/or the listing of the Beetle, as well as the per-unit costs of each of these activities. Based on this analysis, estimates of past and future administrative costs are derived.

A.1 CATEGORIES OF ADMINISTRATIVE COSTS

The following section provides an overview of the categories of administrative cost impacts that arise due to the implementation of Section 7 in the geographic area proposed as critical habitat for the Beetle.

A.1.1 TECHNICAL ASSISTANCE

Frequently, the Service responds to requests for technical assistance from state agencies, local municipalities, and private landowners and developers who may have questions regarding whether specific activities may affect species critical habitat. Technical assistance costs represent the estimated economic costs of informational conversations between these entities and the Service regarding the designation of critical habitat for the Beetle. Most likely, such conversations will occur between municipal or private property owners and the Service regarding lands designated as critical habitat or lands adjacent to critical habitat. The Service's technical assistance activities are voluntary, and generally occur in instances where a Federal nexus does not exist.

A.1.2 SECTION 7 CONSULTATIONS

Section 7(a)(2) of the Act requires Federal agencies (Action agencies) to consult with the Service whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. There are two scenarios under which the designation of critical habitat can result in Section 7 consultations with the Service beyond those required by the listing. These include:

- New consultations, which can occur when activities involving a Federal nexus are proposed in critical habitat not thought to be currently occupied by the species; and
- Re-initiations of consultations, which result when consultations that previously occurred under the listing are re-initiated due to new information or circumstances generated by the designation.

In some cases, consultations will involve the Service and another Federal agency only, such as the U.S. Forest Service. More often, they will also include a third party involved in projects on non-Federal lands with a Federal nexus, such as state agencies and private landowners.

During a consultation, the Service, the Action agency, and the landowner manager applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the proposed critical habitat. Communication between these parties may occur via written letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the activity that has been proposed, the Federal agency, and whether there is a private applicant involved.

Section 7 consultations with the Service may be either informal or formal. *Informal consultations* consist of discussion between the Service, the Action agency, and the applicant concerning an action that may affect a listed species or its designated critical habitat. The process is designed to identify and resolve potential concerns at an early stage in the planning process. By contrast, a *formal consultation* is required if the Action agency determines that its proposed action may, or will, adversely affect the listed species or designated critical habitat in ways that cannot be resolved through informal consultation. The formal consultation process results in the Service's determination in its Biological Opinion of whether the action is likely to jeopardize a species or adversely modify critical habitat, and recommendations to minimize those impacts. Regardless of the type of consultation or proposed project, Section 7 consultations can require substantial administrative effort on the part of all participants.

A.2 ESTIMATED COSTS OF CONSULTATIONS AND TECHNICAL ASSISTANCE

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

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

Table A-1
Estimated Administrative Costs of Consultation and Technical Assistance Efforts (per Effort) (in \$2007)

Consultation Type	Service	Action Agency	Third Party	Biological Assessment
Technical Assistance	\$520	N/A	\$1,050	N/A
Informal Consultation	\$2,250	\$2,900	\$2,050	\$2,000
Formal Consultation	\$5,050	\$5,750	\$3,500	\$4,800
Programmatic Consultation	\$15,250	\$12,750	N/A	\$5,600

Source: Industrial Economics, Inc., analysis based on data from the Federal Government General Schedule Rates, Office of Personnel Management, 2006, and a review of consultation records from several Service field offices across the country.

A.3 SUMMARY OF PAST ADMINISTRATIVE COSTS

Since the listing of the Beetle in 2005, there have been two informal Section 7 consultations (without biological assessments) in the geographic area proposed as critical habitat for the Beetle. Both consultations occurred in 2006, and involved NDOR and the bridge expansions of eastbound and westbound I-80 over Little Salt Creek in the northern portion of the Little Salt Creek – Roper habitat (Unit 3). The administrative cost of these informal consultations is estimated at \$15,000.

A.4 SUMMARY OF FUTURE ADMINISTRATIVE COSTS

In addition to the two historic consultations, seven project specific consultations are anticipated between 2008 and 2027.

- NGPC, as the lead agency of a broad partnership of resource organizations, including the City of Lincoln, Lancaster County Board of Commissioners, LPSNRD, NDOR, UNL, SWCP, TNC, NRCS, and the Service, is in the process of developing a new HCP to protect the Beetle and the eastern saline wetlands of Nebraska. The Salt Creek tiger beetle HCP will take approximately three years to complete, with work expected to begin in spring 2007 (see Chapter 3.0). The economic analysis assumes a formal consultation on this HCP will occur in 2009.
- Lancaster County is expected to be involved in four informal consultations with the Service and Federal permitting agency (such as the ACOE) on a bridge replacement sometime after 2012 (see Chapter 6.0). Two of the bridges (C91 and C172) are located in the vicinity of Upper Little Salt Creek North habitat (Unit 1) and two are in the vicinity of Little Salt Creek – Arbor Lake habitat (Unit 2).
- The City of Lincoln is expected to be involved in two informal consultations with the Service and Federal permitting agency (such as the ACOE), one on the repaving of Arbor Road and the second on the installation of a water main from 27th Street to 40th Street north of I-80. Both

projects are in the vicinity of Little Salt Creek – Roper habitat (Unit 3) (see Chapter 6.0). The repaving project is expected to occur sometime during 2008 to 2012, while the water main project is expected during 2014 to 2022.

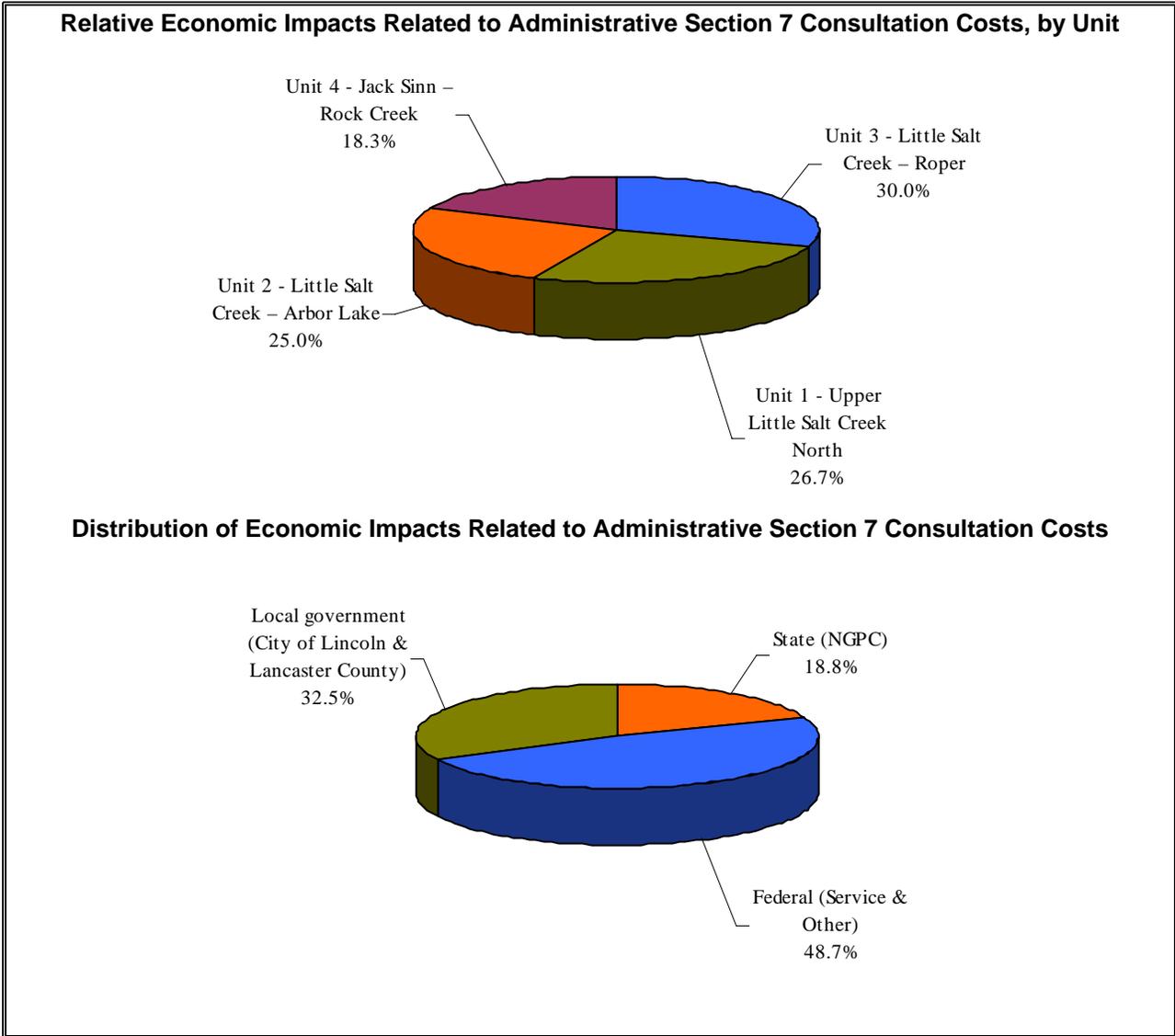
A.4 SUMMARY OF IMPACTS

Table E-7 in Appendix E provides a summary of administrative costs that have occurred (pre-designation) or are anticipated to occur (post-designation) associated with Section 7 consultations and the proposed critical habitat designation. Pre-designation administrative costs are expected to total approximately \$15,000 (in 2007 dollars). After the designation, approximately \$58,000 to \$75,000 in administrative costs are forecast in undiscounted dollars, or between \$47,000 and \$60,000 and \$36,000 and \$46,000 in present value terms at discount rates of three and seven percent, respectively. The distribution of this economic impact ranges from a high of 30 percent in Little Salt Creek – Roper habitat (Unit 3) to a low of 18 percent in Jack Sinn – Rock Creek habitat (Unit 4) (see Figure A-1). The Federal government is expected to bear almost half of the economic impact (49 percent), followed by local governments (33 percent) and the state (19 percent) (see Figure A-1). The annualized economic impact is estimated at \$4,000 (at both three and seven percent).

A.5 CAVEATS

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

Figure A-1
Economic Impacts Related to Administrative Section 7 Consultation Costs



This appendix considers the extent to which the impacts discussed in the main report could be borne by small businesses and the energy industry. The analysis presented in Section B.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA), U.S. Census Bureau, U.S. Department of Agriculture (USDA), National Agriculture Statistics Service (NASS), and personal communication with personnel from the Lincoln Department of Public Works and Utilities (LDPWU). The energy analysis in Section B.2 is conducted pursuant to Executive Order No. 13211. Information for this analysis was gathered from personal communication with personnel from the Lincoln Electric System (LES).

B.1 IMPACTS TO SMALL ENTITIES

When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).¹²⁴ No Initial Regulatory Flexibility Analysis (IRFA) is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for Beetle conservation efforts to affect small entities.

B.1.1 SUMMARY OF IMPACTS ON SMALL ENTITIES

This screening analysis is based on the estimated impacts associated with the proposed rulemaking as described in Chapters 2 through 6 of this analysis. The analysis evaluates the potential for economic impacts related to several categories, including: (1) land development; (2) development of the Salt Creek tiger beetle HCP; (3) public and non-governmental organization conservation and restoration; (4) agriculture; and (5) transportation and public works projects. As summarized below and presented in more detail in Section B.1.2, only small agriculture entities are expected to be affected by conservation efforts for the Beetle.

- Development of the Salt Creek tiger beetle HCP (Chapter 3) is expected to be carried out by state, Federal, and local government agencies, non-profit and conservation groups, and the University of Nebraska at Lincoln (UNL), and is not anticipated to impact small entities.

¹²⁴ 5 U.S.C. 601 et seq.

- Conservation and restoration activities (Chapter 4) are expected to be carried out by the Saline Wetlands Conservation Partnership (SWCP), a collaboration of five partner organizations, including the City of Lincoln, Lancaster County, Lower Platte South Natural Resource District (LPSNRD, a local unit of the state government formed to manage the state’s natural resources), The Nature Conservancy (TNC), and Nebraska Game and Parks Commission (NGPC), and TNC and LPSNRD individually, and are not anticipated to impact small entities.
- Transportation and public works projects (Chapter 6) are expected to be carried out by the City of Lincoln (LDPWU and LES) and Lancaster County, and are not anticipated to impact small entities.
- Land development, including conversion of cropland to pasture (Chapter 5), is expected to be primarily carried out by private landowners. These landowners are likely to include small farmers. This screening analysis, therefore, focuses on economic impacts resulting from loss of agriculture land values and modifications to farming activities.

Table B-1 summarizes the estimated impacts to small entities described in detail in the remainder of this appendix.

**Table B-1
Summary of Impacts to Small Entities**

Activity	Total Number of Affected Small Entities	Percentage of Total Small Entities that are Expected to be Affected	Estimated Impact per Small Entity	Percentage Impact per Small Entity
Agriculture	76 farms	2.7% of all small farms in Lancaster and Saunders counties	\$13 - \$26 in annual revenues \$160,842 - \$162,592 in land value	< 0.02% - 0.07% of average annual sales 15.9% - 22.8% of average asset (land, machinery, and equipment) value

B.1.2 DETAILED ANALYSIS OF IMPACTS TO SMALL ENTITIES

The Endangered Species Act (Act) requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that the Service designate critical habitat “on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat.” This section grants the Secretary [of Interior] to exclude any area from critical habitat if (s)he determines “the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat”. The Secretary’s discretion is limited, as (s)he may not exclude areas if so doing “will result in the extinction of the species.”

Three types of small entities are defined in the RFA:

- Small Business - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under Section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The U.S. Small Business Administration (SBA) has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- Small Governmental Jurisdiction - Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
- Small Organization - Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc. Depending upon state laws, it may be difficult to distinguish whether a small entity is a government or non-profit entity. For example, a water supply entity may be a cooperative owned by its members in one case and in another a publicly chartered small government with the assets owned publicly and officers elected at the same elections as other public officials.

The courts have held that the RFA/SBREFA requires federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities expected to be regulated were large businesses; however, their customers – transmitting utilities such as electric cooperatives – included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could, therefore, certify that small entities were not directly affected within the definition of the RFA.¹²⁵

Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency (EPA)* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and

¹²⁵ 773 F. 2d 327 (D.C. Cir. 1985).

particulate matter.¹²⁶ The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and, therefore, small entities were not directly affected within the definition of the RFA.

The SBA, in its guidance on how to comply with the RFA, recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.¹²⁷ “If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy (of the SBA) believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the federal agency to some other governing body.”¹²⁸

The regulatory mechanism through which critical habitat protections are enforced is Section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this screening analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity. The small entities described in this appendix are not considered to be directly regulated by the Service through Section 7.

This screening analysis focuses on small entities that may bear the regulatory costs quantified in Chapters 2 through 6 of this economic analysis. Of the affected activities discussed in the economic analysis, only impacts to land development (Chapter 2) and agriculture (Chapter 5) activities are forecast to be borne by small entities.

B.1.2.1 Small Governments

The boundary of one city government, the city of Lincoln, is adjacent to or bisects the proposed designation. However, with a population of 235,594 (2003), the City exceeds the criteria (service population of 50,000 or less) for “small entity.”¹²⁹ The designation also falls inside the boundaries of the

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

¹²⁷ Small Business Administration, Office of Advocacy, May 2003, “A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, p. 20.

¹²⁸ *Ibid.*, p. 21.

¹²⁹ U.S. Census Bureau, State & County QuickFacts, <http://quickfacts.census.gov/qfd/>, accessed February 14, 2007.

LPSNRD, a local unit of the state government formed to manage the state's natural resources. Considering the LPSNRD service area includes nearly all of Lancaster and Cass counties and parts of Seward, Saunders, Otoe, and Butler counties, the agency clearly exceeds the service population threshold for small government.¹³⁰ Other state organizations (NGPC and Board of Educational Lands and Funds, or BELF) and county governments (Lancaster and Saunders counties) impacted by the proposed designation also exceed the service population threshold for small government, and are not considered in this small business impacts analysis.

B.1.2.2 Small Organizations

TNC is also involved in Beetle conservation activities.¹³¹ Considering the mission of this organization is to preserve, restore, and protect natural resources, including the Beetle and its habitat, the impact of Beetle conservation activities on TNC is not considered in this small business impacts analysis. Another conservation organization involved in Beetle conservation, the SWCP, is also not considered in this small business impacts analysis as the purpose of this conservation partnership is to conserve and restore the remaining saline wetlands by combining resources, prioritizing, and better coordinating the efforts of its partners. Further, each of the partner organizations (City of Lincoln, Lancaster County, LPSNRD, TNC, and NGPC) individually exceeds the threshold for small government or small organization.

The designation also impacts two public utilities operated by the City of Lincoln, LDPWU and LES. LDPWU, services the City of Lincoln, providing water and wastewater treatment to 71,800 residential customers and 4,492 non-residential customers.¹³² The utility only services the area within the city limits and is the only water/wastewater agency in the City. LES services approximately 200 square miles within Lancaster County, including the cities of Lincoln, Prairie Home, Waverly, Walton, Cheney, and Emerald, and provides energy to more than 105,000 residential customers and 15,000 commercial and industrial customers.¹³³ Considering LDPWU is the dominant supplier of water and wastewater treatment services to the City of Lincoln (95,199 housing units¹³⁴) and that LES is the dominant supplier of energy to Lancaster County (113,873 housing units¹³⁵), and that both utilities service a population that greatly

¹³⁰ Lower Platte South Natural Resource District, <http://www.lpsnrd.org/index.htm>, accessed February 14, 2007.

¹³¹ The mission of TNC "...is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive," <http://nature.org/aboutus/>, accessed February 14, 2007.

¹³² Personal communication with Doug Luedtke, Utilities Business Manager, City of Lincoln Department of Public Works and Utilities, February 27, 2007.

¹³³ Lincoln Electric System, Mission and Background, http://www.les.com/your_les/mission.asp

¹³⁴ US Census Bureau, 2005 Census Data, State and County QuickFacts, <http://quickfacts.census.gov/qfd/states/31/3128000.html>, accessed February 27, 2007.

¹³⁵ Ibid.

exceeds the criteria (service population of 50,000 or less) for “small entity,” the utilities clearly exceed the threshold for small organization.

Less than one-tenth of one percent of prospective economic impacts consists of HCP costs funded by UNL, a state university. Since these costs are expected to be borne by the state, this category of impacts is not expected to affect small entities. However, the analysis in the main report determined that species conservation activities would be incurred by farmers and ranchers. This section considers the extent to which the costs presented in the main report reflect impacts to small agriculture entities.

B.1.2.3 Number of Small Entities to which the Proposed Rule will Apply

This analysis estimates that 76 farmers (2.7 percent of small farmers) in the region may be affected by conservation efforts for the Beetle.

Based on the results reported in Chapters 2 and 5 of the economic analysis, small businesses potentially affected by conservation efforts to protect the Beetle include farming and ranching operations. SBA’s small business size standard for farming and ranching is annual sales of \$750,000.¹³⁶ Recent county-level farm sales data from the NASS 2002 Agriculture Census is used to determine the number of small agribusinesses operating within the proposed designation.¹³⁷ Unfortunately, the largest reported category of sales information reported in the 2002 Agriculture Census data is for the number of operations with annual farm sales greater than \$500,000, which is \$250,000 less than the SBA small business threshold. Nevertheless, the 2002 Agriculture Census data does indicate that 2,764 farms were operating within the two counties that encompass the proposed designation, and more than 98 percent of these farms (i.e., 2,712 individuals) have annual sales less than \$500,000, or approximately \$39,600 (Lancaster County) and \$68,600 (Saunders County) per operation on average; the remaining two percent (i.e., 52 individuals) account for an estimated 44 percent of the annual farm sales in the two counties, or approximately \$2.1 million per operation on average. These data indicate that farming and ranching businesses in the area surrounding the proposed designation tend to be small. For the purpose of this small business analysis, considering a high percentage of farming and ranching operations in the area surrounding the proposed designation have annual sales below \$500,000, all agriculture operations forecast to be impacted by conservation efforts for the Beetle are considered small.

To understand to what extent these potential impacts may be experienced by small entities, this analysis assumes that the number of private landowners who own agriculture land in the proposed critical habitat represent the number of impacted agriculture operations. Land title records from the Lancaster and

¹³⁶ U.S. Small Business Administration, July 31, 2006, “Small Business Size Standards Matched to North American Industry Classification System.”

¹³⁷ U.S. Department of Agriculture, National Agriculture Statistics Service, June 2004, “2002 Census of Agriculture, Nebraska, State and County Data, Volume 1, Geographic Area Series, Part 27, AC-02-A-27,” Table 2.

Saunders county Assessor Offices indicate 76 individuals (private landowners, not public or non-profit landowners) own land affected by the proposed designation. Assuming each of these individuals represents a farm, the 76 individuals represent 2.7 percent of the total number of small farms and ranches operating within the two counties that encompass the proposed designation.

B.1.2.4 Economic Impact of Compliance Requirements on Small Entities

The 76 small farmers expected to be affected are forecast to experience an impact equivalent to less than 0.07 percent of estimated annual sales, or 23 percent of farm asset value.

As described in Chapter 5, Beetle conservation activities are not expected to impact the annual profitability of the 76 small ranching and farming operations; less than \$30 in annualized revenue-related impacts per land owner out of average annual sales of \$39,600 and \$68,600 in Lancaster and Saunders counties, respectively, or less than one-tenth of one percent of average annual revenues.

While farm profits are not expected to be affected by species conservation, impacted small agriculture businesses are expected to lose between \$12.2 and \$12.4 million in land value due to species conservation, or \$161,000 to \$163,000 per operator, on average (Chapters 2.0 and 5.0). Considering the average market value of a farm's assets (i.e., land, buildings, machinery, and equipment) in the affected counties ranges from \$713,000 (Lancaster County) to \$1.0 million (Saunders County),¹³⁸ the economic impacts of species conservation to the small agriculture operator is expected to range from 15.9 percent (Saunders County) to 22.8 percent (Lancaster County) of the average operator's farm assets.

Note that this is a best estimate impact. Given the small number of farming operations expected to be impacted by this designation, and the variability in farm size, in terms of land acreage, buildings, and machinery and equipment inventory, actual impacts may vary. Furthermore, the impact to small agriculture businesses represents the maximum possible impact. Alternatively, the impacts quantified in Chapter 2.0 could be presented as the cost of conservation easement acquisitions to protect the species and its habitat. Private owners of parcels affected by the proposed critical habitat may eventually be able to sell the development opportunity (i.e., conservation easement) on their parcels under the future Salt Creek Tiger Beetle HCP Program (Chapter 3.0) or to State or local governments or NGOs interested in acquiring conservation easements (Chapter 4.0). Landowners can also enter their land into a permanent conservation program with the federal or State government (Chapter 5.0). Under these scenarios, the development impact in would be to the public or NGO, not the private landowner, as the development opportunity would be purchased from the private landowner with public or NGO funds. Should landowners sell a conservation easement or participate in a permanent

¹³⁸ U.S. Department of Agriculture, National Agriculture Statistics Service, June 2004, "2002 Census of Agriculture, Nebraska, State and County Data, Volume 1, Geographic Area Series, Part 27, AC-02-A-27," Tables 8 and 38.

conservation program, the total impacts measured by the economic analysis will not change; the only change will be who bears the impact.

B.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”¹³⁹

The Office of Management and Budget (OMB) provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute “a significant adverse effect” when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day;
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of five million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of one billion kilowatt-hours per year, or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.¹⁴⁰

One of these criteria, increase in the cost of energy distribution in excess of one percent, is relevant to this analysis. The following analysis determines whether the electricity industry is likely to experience “a significant adverse effect” as a result of beetle conservation activities.

¹³⁹ Office of Management and Budget, Memorandum for Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance for Implementing E.O. 13211, M-01-27, Office of Management and Budget, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>, accessed July 31, 2001.

¹⁴⁰ Ibid.

B.2.1 EVALUATION OF WHETHER THE DESIGNATION WILL RESULT IN AN INCREASE IN THE COST OF ENERGY DISTRIBUTION IN EXCESS OF ONE PERCENT

As reported in Section 6.3, the City of Lincoln will complete a loop of high voltage bulk transmission lines (NTTLP) around the City, ensuring more dependable service for the area. While no facilities are proposed within the proposed habitat, the NTTLP line avoids saline wetlands in the Little Salt Creek - Arbor Lake habitat (Unit 2) at a cost of approximately \$500,000 in additional construction costs. Additional costs due to overhead time, administrative time, staff time, schedule time, and public review time can also be attributed to the Beetle, but were not estimated by LES.

The depreciable life of LES' transmission and distribution (T&D) facilities is 40 years, and LES depreciates its transmission and distribution facilities using straight line depreciation.¹⁴¹ Based on the utility's standard accounting practices, annual depreciation would increase by \$12,500.¹⁴² Compared to the LES T&D depreciation expense for 2006 (\$10.4 million¹⁴³), the annual incremental cost for this additional expenditure is 0.12 percent, less than the one percent threshold suggested by OMB.¹⁴⁴

¹⁴¹ Personal Communication with Dan Pudenz, V.P. of Engineering, Lincoln Electric System, February 21, 2007.

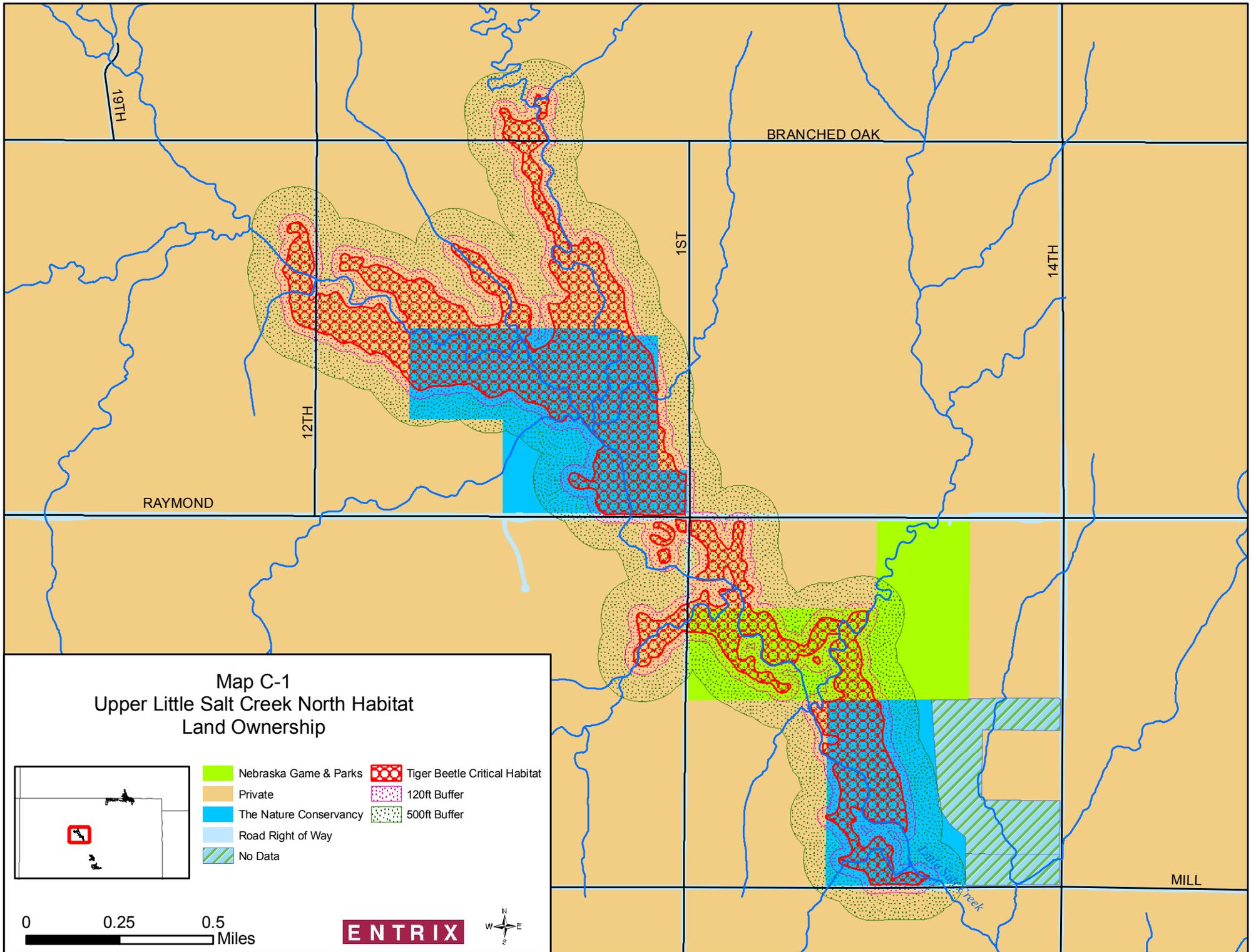
¹⁴² $\$500,000 \div 40 \text{ years} = \$12,500$.

¹⁴³ Personal Communication with Dan Pudenz, V.P. of Engineering, Lincoln Electric System, February 21, 2007.

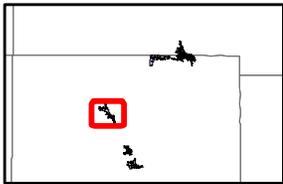
¹⁴⁴ $\$12,500 \div \$10,361,000 = 0.0012$.

APPENDIX C

DETAILED MAPS OF CURRENT LAND OWNERSHIP WITHIN PROPOSED DESIGNATION



Map C-1
Upper Little Salt Creek North Habitat
Land Ownership

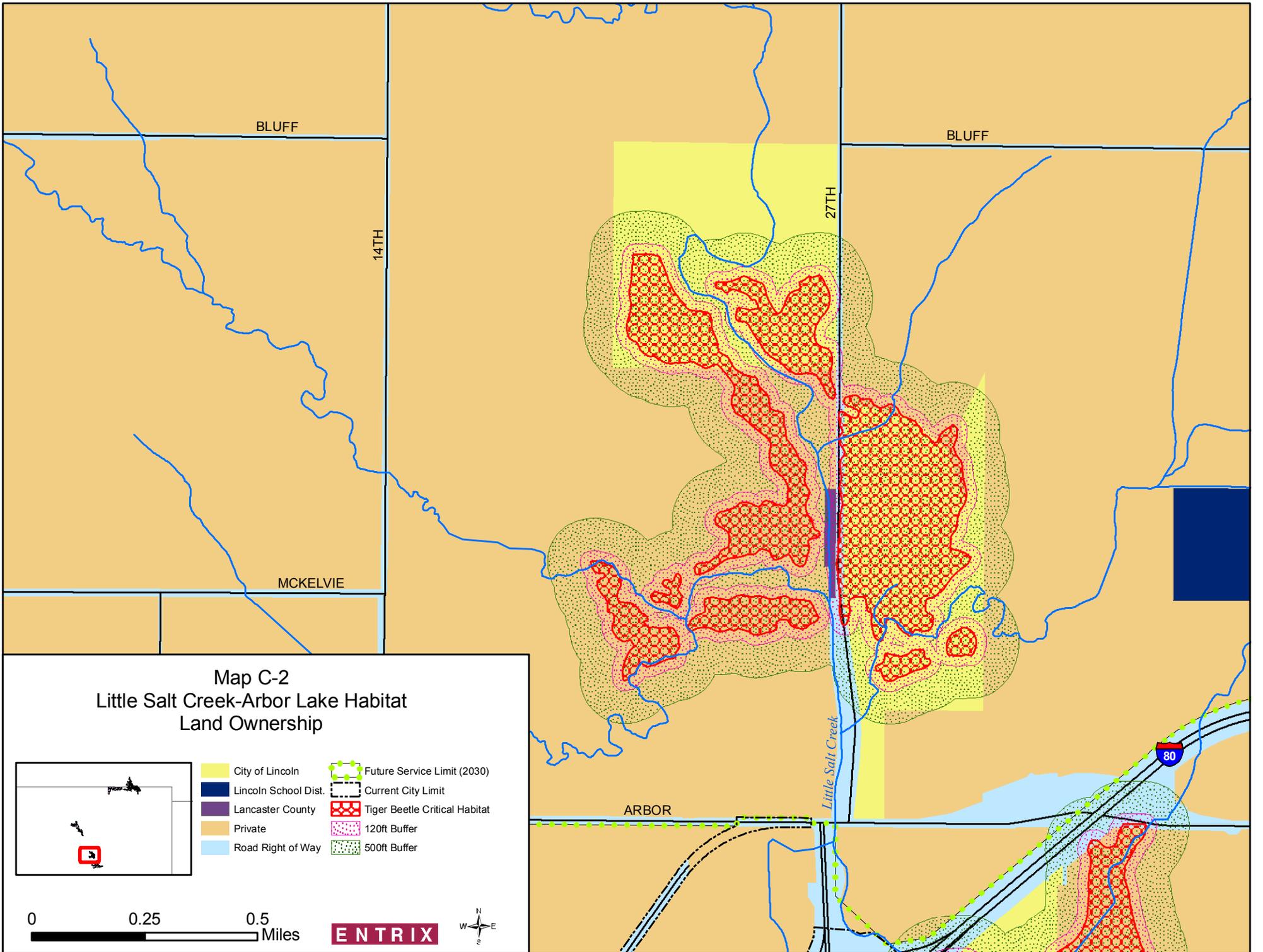


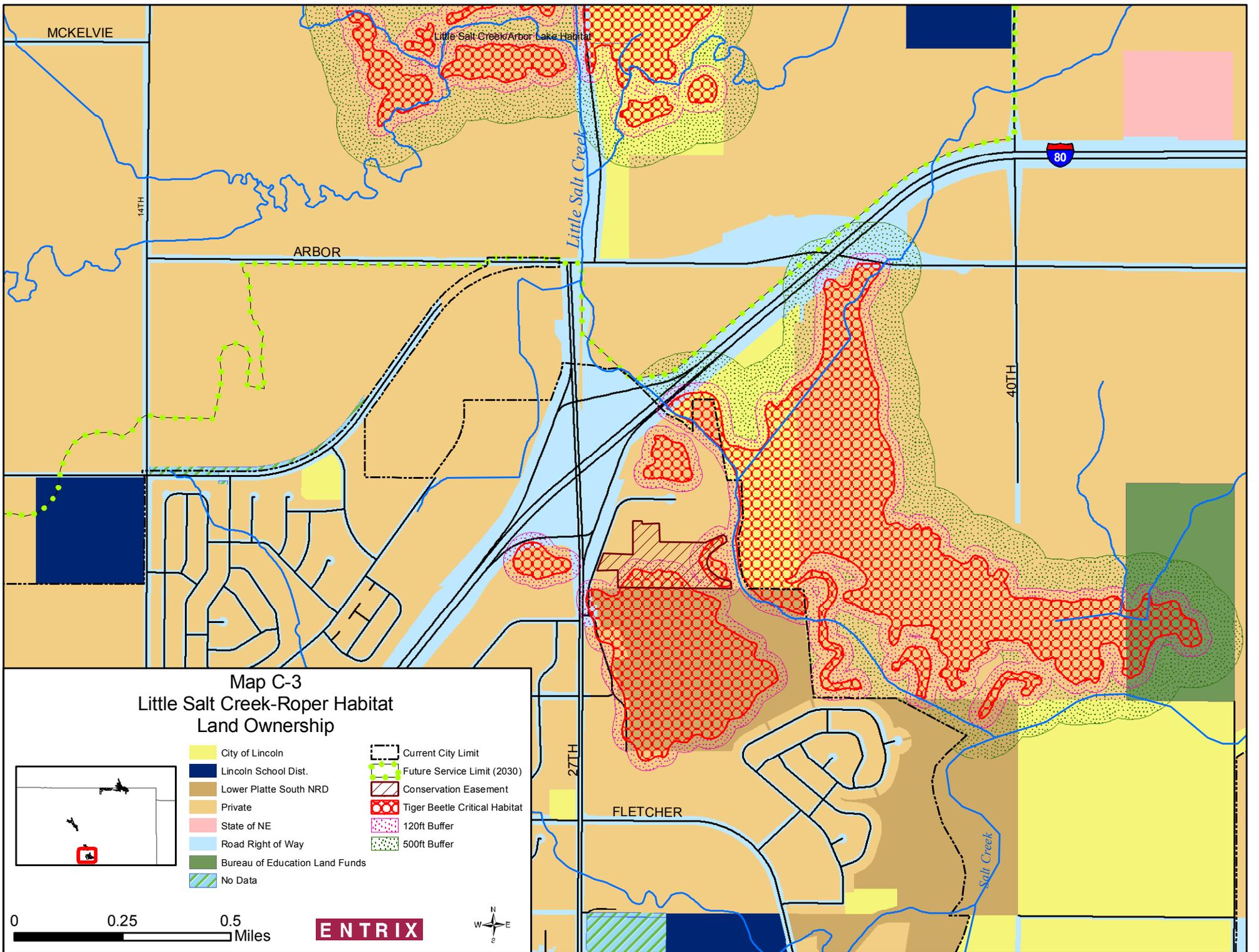
- | | |
|--|---|
|  Nebraska Game & Parks |  Tiger Beetle Critical Habitat |
|  Private |  120ft Buffer |
|  The Nature Conservancy |  500ft Buffer |
|  Road Right of Way | |
|  No Data | |

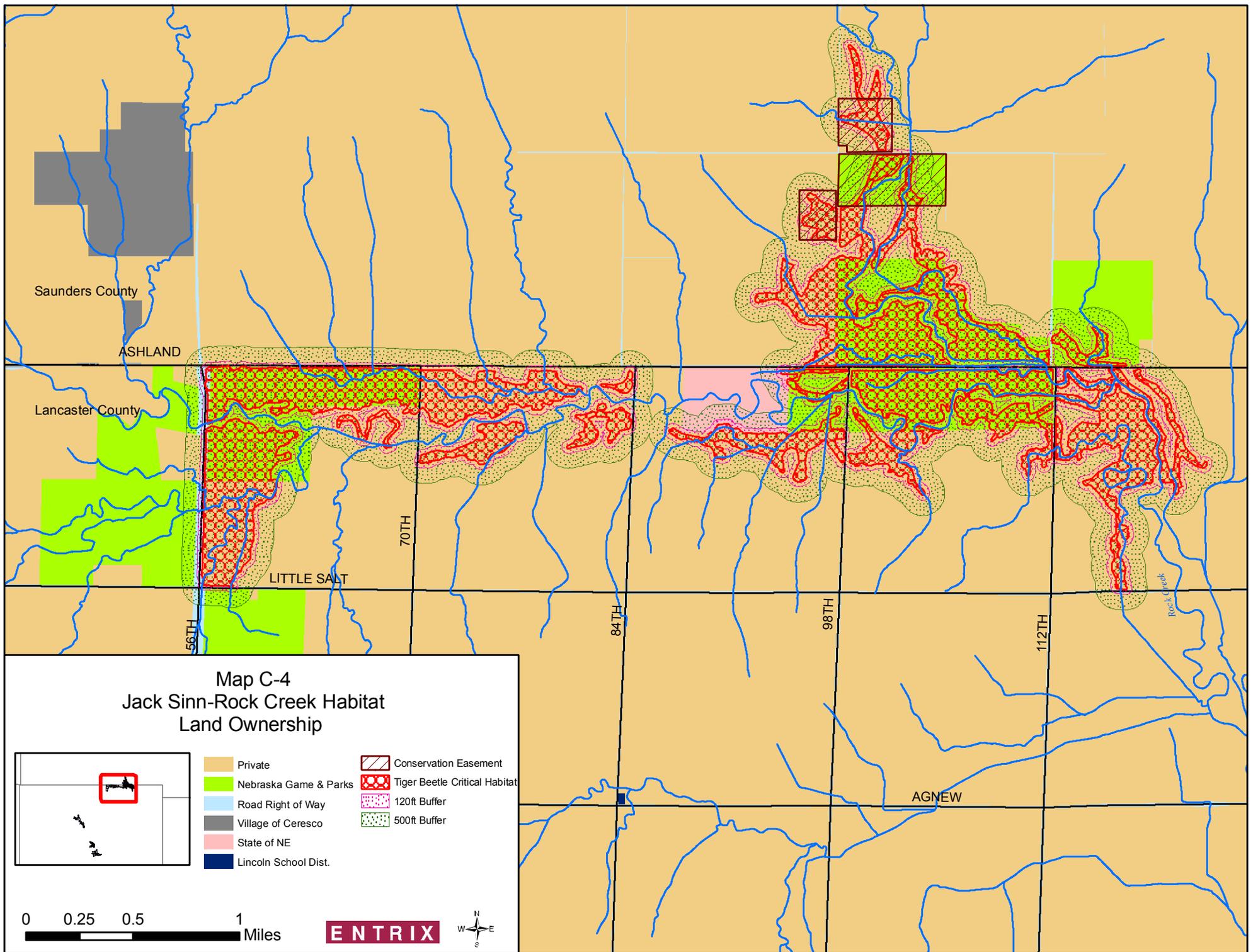
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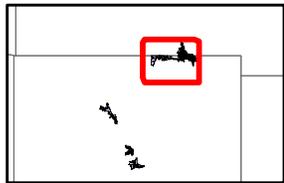








Map C-4
 Jack Sinn-Rock Creek Habitat
 Land Ownership



- | | |
|-----------------------|-------------------------------|
| Private | Conservation Easement |
| Nebraska Game & Parks | Tiger Beetle Critical Habitat |
| Road Right of Way | 120ft Buffer |
| Village of Ceresco | 500ft Buffer |
| State of NE | |
| Lincoln School Dist. | |

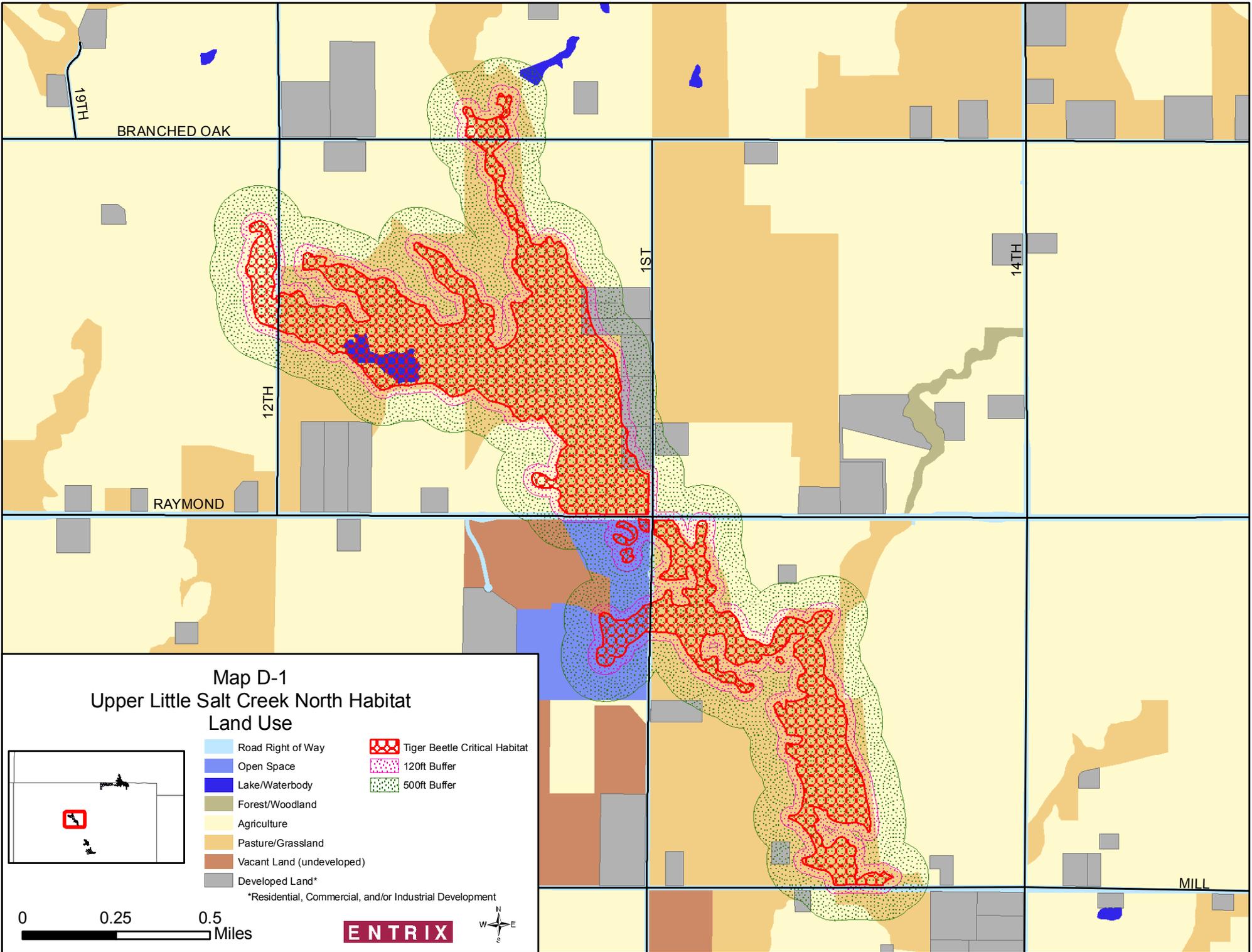
0 0.25 0.5 1 Miles

ENTRIX



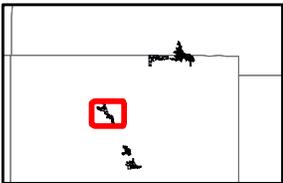
APPENDIX D

DETAILED MAPS OF CURRENT LAND USES WITHIN PROPOSED DESIGNATION



**Map D-1
Upper Little Salt Creek North Habitat
Land Use**

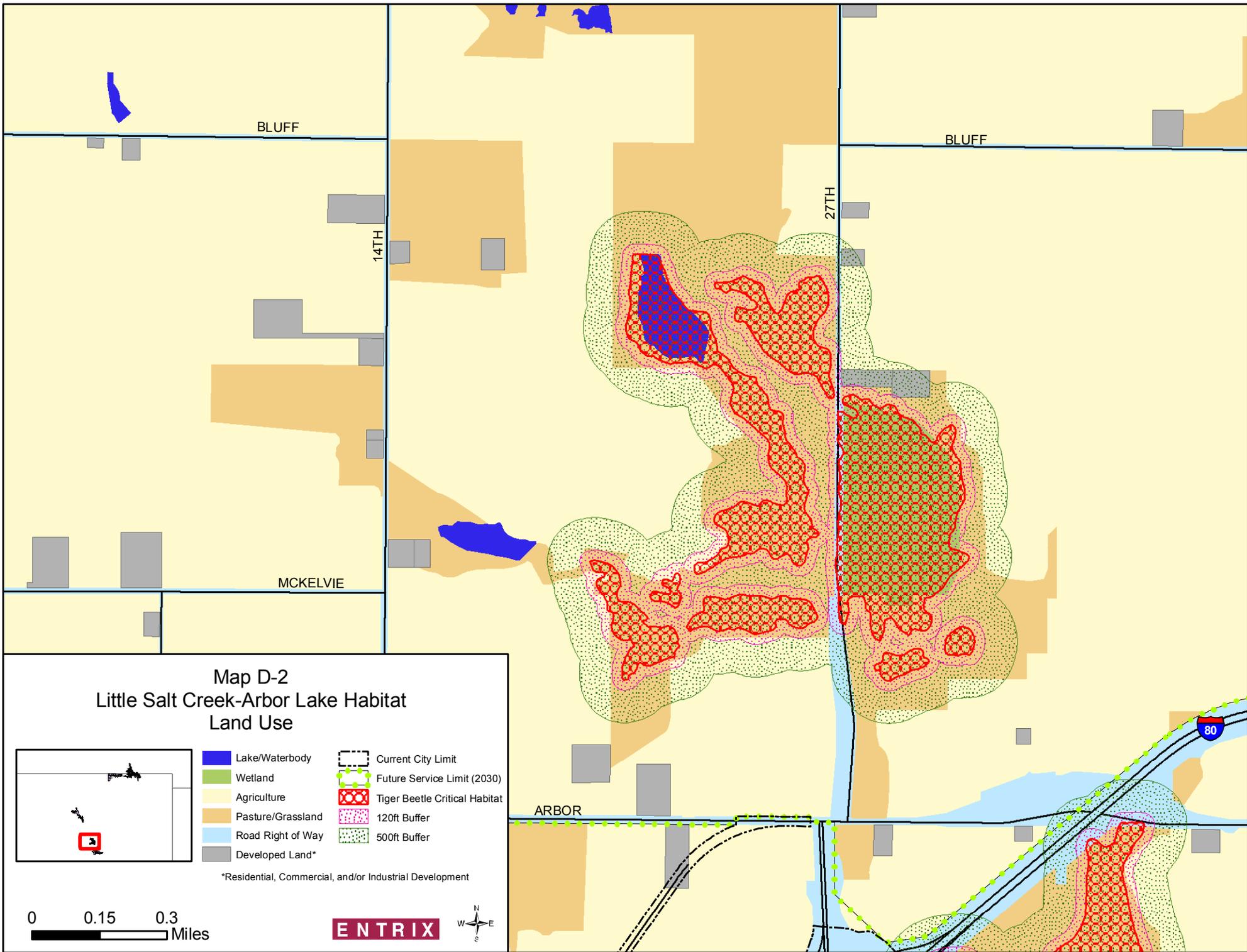
- | | |
|---|---|
|  Road Right of Way |  Tiger Beetle Critical Habitat |
|  Open Space |  120ft Buffer |
|  Lake/Waterbody |  500ft Buffer |
|  Forest/Woodland | |
|  Agriculture | |
|  Pasture/Grassland | |
|  Vacant Land (undeveloped) | |
|  Developed Land* | |
- *Residential, Commercial, and/or Industrial Development



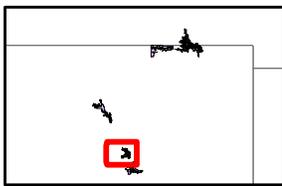
0 0.25 0.5
Miles

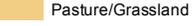
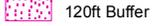
ENTRIX





Map D-2
Little Salt Creek-Arbor Lake Habitat
Land Use



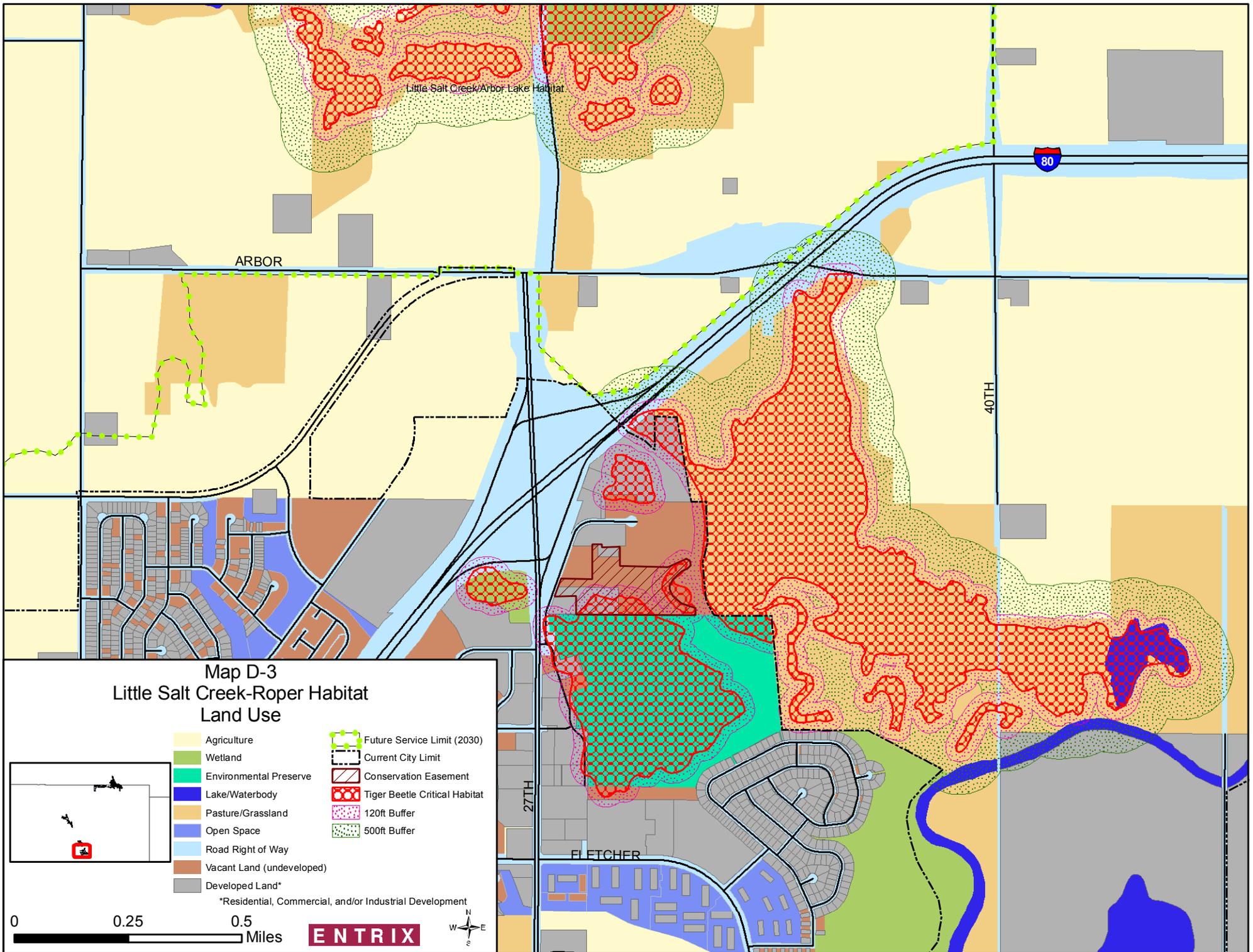
- | | |
|---|---|
|  Lake/Waterbody |  Current City Limit |
|  Wetland |  Future Service Limit (2030) |
|  Agriculture |  Tiger Beetle Critical Habitat |
|  Pasture/Grassland |  120ft Buffer |
|  Road Right of Way |  500ft Buffer |
|  Developed Land* | |

*Residential, Commercial, and/or Industrial Development

0 0.15 0.3
 Miles

ENTRIX

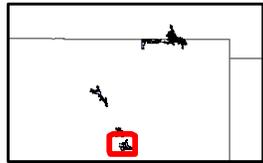
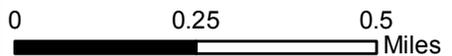


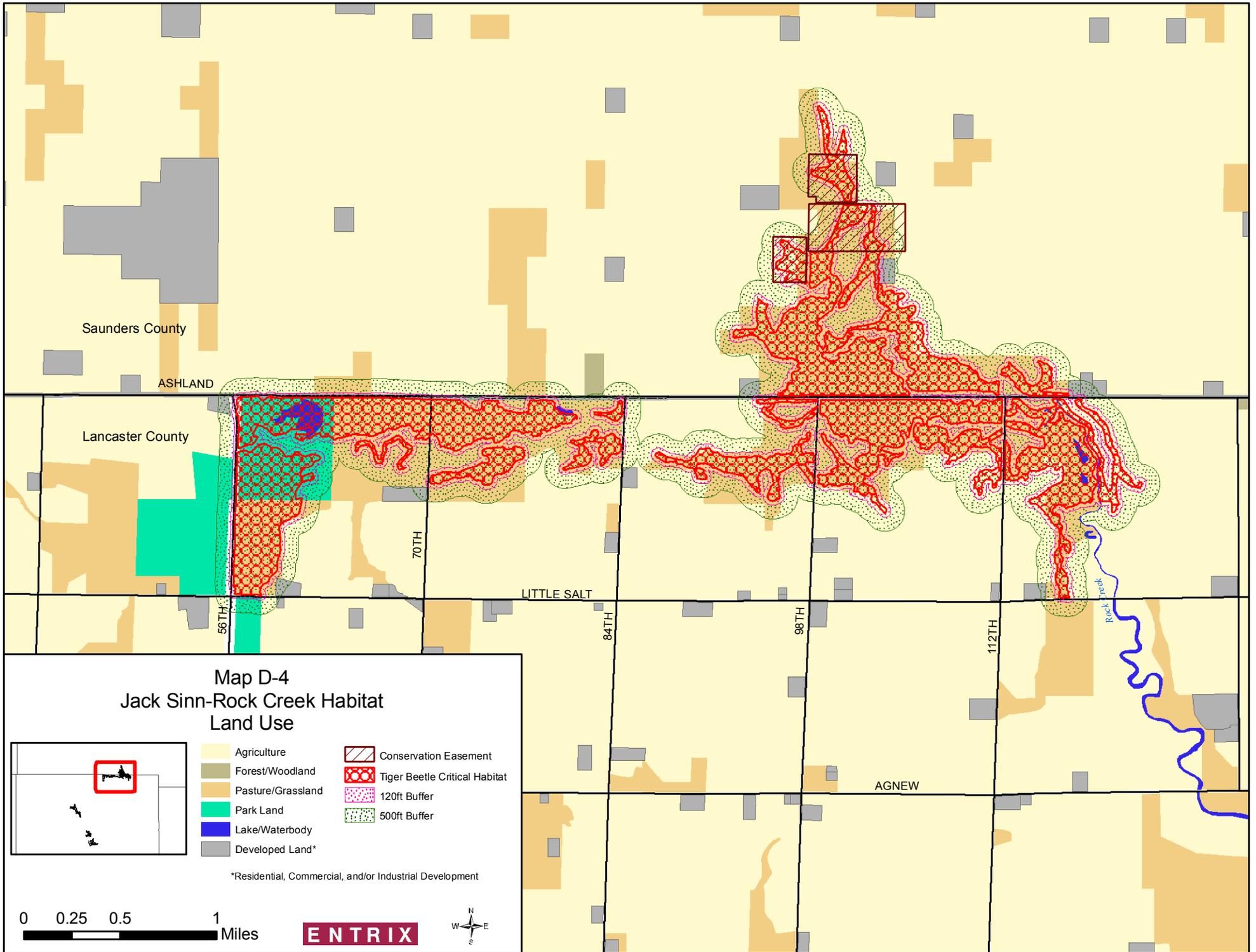


Map D-3
Little Salt Creek-Roper Habitat
Land Use

- | | |
|---|---|
|  Agriculture |  Future Service Limit (2030) |
|  Wetland |  Current City Limit |
|  Environmental Preserve |  Conservation Easement |
|  Lake/Waterbody |  Tiger Beetle Critical Habitat |
|  Pasture/Grassland |  120ft Buffer |
|  Open Space |  500ft Buffer |
|  Road Right of Way | |
|  Vacant Land (undeveloped) | |
|  Developed Land* | |

*Residential, Commercial, and/or Industrial Development

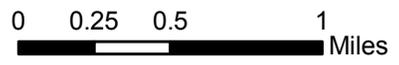




Map D-4
 Jack Sinn-Rock Creek Habitat
 Land Use

- | | |
|---|---|
|  Agriculture |  Conservation Easement |
|  Forest/Woodland |  Tiger Beetle Critical Habitat |
|  Pasture/Grassland |  120ft Buffer |
|  Park Land |  500ft Buffer |
|  Lake/Waterbody | |
|  Developed Land* | |

*Residential, Commercial, and/or Industrial Development



APPENDIX E

SUMMARY RESULTS AT SEVEN PERCENT, THREE PERCENT, AND UNDISCOUNTED

**Table E-1
Summary of Total Economic Impacts, by Habitat Unit, in \$1,000s**

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)									
			Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Unit 1 - Upper Little Salt Creek North	\$446	\$452	\$2,300	\$3,182	\$1,998	\$2,645	\$1,733	\$2,185	\$134	\$177	\$164	\$206
Unit 2 - Little Salt Creek – Arbor Lake	\$1,231	\$1,231	\$2,372	\$2,709	\$2,217	\$2,465	\$2,077	\$2,252	\$148	\$165	\$196	\$213
Unit 3 - Little Salt Creek – Roper	\$404	\$404	\$10,906	\$11,415	\$10,549	\$10,922	\$10,234	\$10,492	\$710	\$734	\$966	\$989
Unit 4 - Jack Sinn – Rock Creek	\$480	\$481	\$5,844	\$8,222	\$5,086	\$6,857	\$4,412	\$5,679	\$343	\$461	\$417	\$535
Total	\$2,561	\$2,568	\$21,422	\$25,528	\$19,850	\$22,889	\$18,456	\$20,608	\$1,335	\$1,537	\$1,743	\$1,943

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table E-2
Summary of Economic Impacts to Development, by Habitat Unit, in \$1,000s

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)											
			Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%			
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High		
Unit 1 - Upper Little Salt Creek North	\$0	\$0	\$801	\$801	\$801	\$801	\$801	\$801	\$801	\$801	\$54	\$54	\$76	\$76
Unit 2 - Little Salt Creek – Arbor Lake	\$0	\$0	\$1,374	\$1,374	\$1,374	\$1,374	\$1,374	\$1,374	\$1,374	\$1,374	\$92	\$92	\$130	\$130
Unit 3 - Little Salt Creek – Roper	\$0	\$0	\$9,279	\$9,279	\$9,279	\$9,279	\$9,279	\$9,279	\$9,279	\$9,279	\$624	\$624	\$876	\$876
Unit 4 - Jack Sinn – Rock Creek	\$0	\$0	\$1,823	\$1,823	\$1,823	\$1,823	\$1,823	\$1,823	\$1,823	\$1,823	\$123	\$123	\$172	\$172
Total	\$0	\$0	\$13,277	\$13,277	\$13,277	\$13,277	\$13,277	\$13,277	\$13,277	\$13,277	\$893	\$893	\$1,254	\$1,254

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table E-3
Summary of Economic Impacts Related to the Salt Creek Tiger Beetle HCP, by Habitat Unit, in \$1,000s

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)									
	Low	High	Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
			Low	High	Low	High	Low	High	Low	High	Low	High
Unit 1 - Upper Little Salt Creek North	\$63	\$63	\$393	\$393	\$304	\$304	\$229	\$229	\$20	\$20	\$22	\$22
Unit 2 - Little Salt Creek – Arbor Lake	\$35	\$35	\$219	\$219	\$169	\$169	\$127	\$127	\$11	\$11	\$12	\$12
Unit 3 - Little Salt Creek – Roper	\$59	\$59	\$370	\$370	\$286	\$286	\$215	\$215	\$19	\$19	\$20	\$20
Unit 4 - Jack Sinn – Rock Creek	\$210	\$210	\$1,318	\$1,318	\$1,019	\$1,019	\$766	\$766	\$68	\$68	\$72	\$72
Total	\$367	\$367	\$2,300	\$2,300	\$1,778	\$1,778	\$1,337	\$1,337	\$118	\$118	\$126	\$126

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table E-4
Summary of Economic Impacts to Public and Non-Governmental Organization Conservation Activities, by Habitat Unit, in \$1,000s

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)									
	Low	High	Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
			Low	High	Low	High	Low	High	Low	High	Low	High
Unit 1 - Upper Little Salt Creek North	\$383	\$389	\$941	\$1,795	\$774	\$1,395	\$622	\$1,050	\$52	\$94	\$59	\$99
Unit 2 - Little Salt Creek – Arbor Lake	\$953	\$953	\$445	\$768	\$374	\$610	\$308	\$472	\$25	\$41	\$29	\$45
Unit 3 - Little Salt Creek – Roper	\$109	\$109	\$590	\$993	\$499	\$794	\$414	\$619	\$34	\$53	\$39	\$58
Unit 4 - Jack Sinn – Rock Creek	\$270	\$271	\$2,615	\$4,860	\$2,156	\$3,795	\$1,736	\$2,872	\$145	\$255	\$164	\$271
Total	\$1,715	\$1,722	\$4,591	\$8,416	\$3,803	\$6,594	\$3,080	\$5,013	\$256	\$443	\$291	\$473

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table E-5
Summary of Economic Impacts to Agriculture, by Habitat Unit, in \$1,000s

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)									
			Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Unit 1 - Upper Little Salt Creek North	\$0	\$0	\$14	\$37	\$14	\$37	\$14	\$36	\$1	\$2	\$1	\$3
Unit 2 - Little Salt Creek – Arbor Lake	\$0	\$0	\$1	\$10	\$1	\$10	\$1	\$10	\$0	\$1	\$0	\$1
Unit 3 - Little Salt Creek – Roper	\$0	\$0	\$0	\$2	\$0	\$2	\$0	\$2	\$0	\$0	\$0	\$0
Unit 4 - Jack Sinn – Rock Creek	\$0	\$0	\$80	\$210	\$80	\$209	\$80	\$208	\$6	\$14	\$8	\$19
Total	\$0	\$0	\$95	\$259	\$95	\$258	\$95	\$256	\$7	\$17	\$9	\$23

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table E-6
Summary of Economic Impacts to Transportation and Public Works Projects, by Habitat Unit, in \$1,000s

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)									
			Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Unit 1 - Upper Little Salt Creek North	\$0	\$0	\$134	\$134	\$92	\$92	\$58	\$58	\$6	\$6	\$5	\$5
Unit 2 - Little Salt Creek – Arbor Lake	\$243	\$243	\$317	\$317	\$287	\$287	\$259	\$259	\$19	\$19	\$24	\$24
Unit 3 - Little Salt Creek – Roper	\$221	\$221	\$650	\$750	\$471	\$543	\$314	\$362	\$32	\$37	\$30	\$34
Unit 4 - Jack Sinn – Rock Creek	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$464	\$464	\$1,101	\$1,201	\$850	\$922	\$631	\$679	\$57	\$62	\$59	\$63

Results are shown in \$1,000s. Numbers may not sum due to rounding

Table E-7
Summary of Section 7 Administrative Costs, by Habitat Unit, in \$1,000s

Unit	Pre-Designation (Total) (2005-2007)		Post-Designation (Total) (2008-2027)									
			Undiscounted		PV 3%		PV 7%		Annualized 3%		Annualized 7%	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Unit 1 - Upper Little Salt Creek North	\$0	\$0	\$17	\$22	\$13	\$16	\$9	\$11	\$1	\$1	\$1	\$1
Unit 2 - Little Salt Creek – Arbor Lake	\$0	\$0	\$16	\$21	\$12	\$15	\$8	\$10	\$1	\$1	\$1	\$1
Unit 3 - Little Salt Creek – Roper	\$15	\$15	\$17	\$21	\$14	\$18	\$12	\$15	\$1	\$1	\$1	\$1
Unit 4 - Jack Sinn – Rock Creek	\$0	\$0	\$8	\$11	\$8	\$11	\$7	\$10	\$1	\$1	\$1	\$1
Total	\$15	\$15	\$58	\$75	\$47	\$60	\$36	\$46	\$4	\$4	\$4	\$4

Results are shown in \$1,000s. Numbers may not sum due to rounding