

## MEMORANDUM | February 5, 2014

**TO** U.S. Fish and Wildlife Service (Service)  
**FROM** Industrial Economics, Incorporated (IEc)  
**SUBJECT** Screening Analysis of the Likely Economic Impacts of Critical Habitat Designation for the Salt Creek Tiger Beetle

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On June 4, 2013, the Service published a proposed rule to designate critical habitat for the Salt Creek tiger beetle (*Cicindela nevadica lincolniana*, hereafter referred to as the “beetle”).<sup>1</sup> As part of the rulemaking process, the Service must consider the economic impacts, including costs and benefits, of the proposed rule in the context of two separate requirements:<sup>2</sup>

- **Executive Order (EO) 12866 *Regulatory Planning and Review***, which directs Agencies to assess the costs and benefits of regulatory actions and quantify those costs and benefits if that action may have an effect on the economy of \$100 million or more in any one year; and
- **Section 4(b)(2) of the Endangered Species Act (the Act)**, which requires the Secretary of the Interior to consider economic impacts prior to designating critical habitat.<sup>3</sup>

This memorandum provides information to the Service on the potential for the proposed critical habitat rule to result in costs exceeding \$100 million in a single year. If costs do not exceed this threshold, EO 12866 suggests that a qualitative assessment may be sufficient. This memorandum also identifies the geographic areas or specific activities that could experience the greatest impacts, measured in terms of changes in social welfare, to inform the Secretary’s decision under section 4(b)(2).<sup>4</sup>

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<sup>1</sup> 78 FR 33282.

<sup>2</sup> Additional laws and executive orders require the consideration of the distribution of impacts on vulnerable subpopulations, such as small entities and state or local governments. These requirements for distributional analysis are beyond the scope of this memorandum.

<sup>3</sup> Published September 20, 1993. As affirmed by *Executive Order 13563: Improving Regulation and Regulatory Review*. January 18, 2011.

<sup>4</sup> The discipline of welfare economics focuses on maximizing societal well-being. (Just, R.E., D.L. Hueth, and A. Schmitz. 2004. *The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation*. Edward Elgar Publishing: Northampton, MA.) It measures costs and benefits in terms of the opportunity costs of employing resources for the conservation of the species and individual willingness to pay to conserve those species. Opportunity cost is the value of the benefit that could have been provided by devoting the resources to their best alternative uses. Opportunity costs differ from the measurement of accounting costs (e.g., actual expenses). Welfare economics is recognized by the U.S. Office of Management and Budget (OMB) as the appropriate tool for valuing the costs and benefits of proposed regulatory actions. (U.S. Office of Management and Budget. 2003. *Circular A-4*.)

To prepare this assessment, we rely on: (1) the proposed rule and associated geographic information systems (GIS) data layers; (2) the Service's incremental effects memorandum described in greater detail later in this memorandum; and (3) interviews with relevant stakeholders.

## FINDINGS OF THE SCREENING ANALYSIS

Critical habitat designation for the beetle is unlikely to generate costs exceeding \$100 million in a single year. Data limitations prevent the quantification of benefits.

### Section 7 Costs

In **occupied habitat**, the economic cost of implementing the rule through section 7 of the Act will most likely be limited to additional administrative effort to consider adverse modification. This finding is based on the following factors:

- The presence of the species results in significant baseline protection under the Act;
- Project modifications requested to avoid jeopardy to the species are also likely to avoid adverse modification of critical habitat. Critical habitat is unlikely to generate recommendations for additional or different project modifications;
- Critical habitat is unlikely to increase the number of consultations occurring in occupied habitat as a result of the existing awareness of the need to consult due to the listing of the species; and
- The proposed designation also receives baseline protection from the presence of the state-listed endangered saltwort.

In **unoccupied habitat**, the designation will generate the need for section 7 consultation on projects or activities that may affect critical habitat. The administrative costs of these consultations, and costs of any project modifications resulting from these consultations, reflect incremental costs of the critical habitat rule. In particular, the Service may request project modifications, including erosion control and biological monitoring for highway projects to avoid adverse modification in unoccupied critical habitat, and grazing restrictions for consultations related to potential conservation partnerships.

Based on the historical consultation rate and forecasts of projects and activities identified by land managers, the number of future consultations is likely to be fewer than 12 in a single year, all of which are expected to be conducted informally. The additional administrative cost of addressing adverse modification during informal section 7 consultation is approximately \$2,400 per consultation, and the full cost of a new informal consultation is approximately \$7,100 per consultation. Incremental project modification costs may include \$360,000 for highway projects in the Oak Creek unit, and up to \$110,000 if grazing enclosures are implemented through conservation partnerships in the Rock Creek unit. Total forecast incremental costs of section 7 consultations, including administrative and project modification costs, are likely to be less than \$540,000 in a given year.

### Other Costs

- The designation of critical habitat may cause farmers and ranchers to perceive that private lands will be subject to use restrictions, resulting in perceptual effects. Such costs, if they occur, are unlikely to reach \$100 million in a given year based on the number of acres most likely to be affected and the value of those acres.
- The designation of critical habitat is unlikely to trigger additional requirements under state or local regulations. This conclusion is based on the likelihood that activities in wetland areas will require Federal permits and therefore section 7 consultation.

### Section 7 and Other Benefits

Additional efforts to conserve the beetle are anticipated in unoccupied habitat. These project modifications may result in direct benefits to the species (e.g., increased potential for recovery) as well as broader improvements to environmental quality in these areas. Due to existing data limitations, we are unable to assess the likely magnitude of such benefits.

### Geographic Distribution of Costs

Incremental costs are likely to be greatest in the Oak Creek unit and are driven by project modifications for highway activities. If grazing restrictions result from conservation partnership agreements, incremental land value losses would occur in the Rock Creek unit. Finally, this memorandum discusses the potential magnitude of reductions in grazing land values if perceptual effects were to occur.

## SECTION 1. BACKGROUND

The Salt Creek tiger beetle is a predaceous insect endemic to the saline wetlands of Lancaster and Saunders counties in eastern Nebraska. The beetle currently exists in three populations, all located along Little Salt Creek in Lancaster County. Historically, the beetle's range may have extended throughout the eastern saline wetlands of Nebraska. The beetle was listed as endangered under the Act in 2005, and critical habitat was previously designated in 2010.<sup>5</sup> Approximately 20 percent of the current proposed designation overlaps the previous critical habitat designation.<sup>6</sup>

The proposed critical habitat rule would designate approximately 1,110 acres (449 hectares) of critical habitat across four units in Lancaster and Saunders counties. Of these units, one (the Little Salt Creek unit) is currently occupied by the beetle and three (the Rock Creek, Oak Creek, and Haines Branch units) are unoccupied. The Service intends to reintroduce the beetle to establish new populations in each of the unoccupied units.<sup>7</sup> Approximately 24 percent of the proposed designation is located on City of Lincoln lands, 20 percent on state lands, five percent on lands managed by conservation organizations, and 51 percent on private lands.<sup>8</sup> Exhibit 1 provides a summary of landownership in the proposed designation, and Exhibit 2 provides an overview map.

Since the listing of the beetle in 2005, 28 informal consultations and one programmatic consultation have addressed effects to the species and its habitat. Of these, 20 occurred since the previous critical habitat designation in 2010, with a maximum of ten consultations in 2012.<sup>9</sup> This increase in consultation frequency in recent years is likely due to an increase in activity levels rather than an increase in awareness of the need to consult, as the three Federal agencies represented in the consultation history (the U.S. Army Corps of Engineers, Natural Resources Conservation Service, and Federal Highway Administration) all consulted with the Service for projects located on the same stream segment prior to the 2010 designation of critical habitat.

Review of the consultation history, the proposed rule, and the Service's incremental effects memorandum identified the following economic activities that may affect the beetle and its habitat:

- (1) Agriculture and livestock grazing;
- (2) Restoration and conservation;
- (3) Residential and commercial development;
- (4) Water management and supply;

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<sup>5</sup> 78 FR 33290-33291

<sup>6</sup> Specifically, 141 acres in the currently proposed Little Salt Creek unit and 83 acres in the currently proposed Rock Creek unit were designated as critical habitat for the beetle in 2010. However, the previous designation also covered additional lands that are not included in the current proposal. In total, approximately 905 acres were designated along Little Salt Creek and 1,028 acres were designated along Rock Creek in 2010. (75 FR 17475)

<sup>7</sup> 78 FR 33291

<sup>8</sup> *Ibid.*

<sup>9</sup> U.S. Fish and Wildlife Service. Biologist, Nebraska Field Office. Personal communication on December 18 and December 19, 2013.

- (5) Transportation activities, including bridge construction; and
- (6) Utility activities.<sup>10</sup>

Interviews with land managers within the proposed designation indicated that some of these activities, such as development and water management, are not likely to occur in the foreseeable future. The following sections of this memorandum summarize the economic activities and associated consultations that are anticipated within the proposed designation.

**EXHIBIT 1. SUMMARY OF PROPOSED CRITICAL HABITAT UNITS FOR THE BEETLE**

OCCUPANCY	UNIT	LAND OWNER	ACRES <sup>a</sup>	PERCENT OF UNIT
Occupied	Little Salt Creek	City of Lincoln	40	14%
		Lower Platte South Natural Resources District	19	7%
		Nebraska Game & Parks Commission	41	14%
		The Nature Conservancy	29	10%
		Pheasants Forever	11	4%
		Private	144	51%
		<i>Subtotal</i>	284	100%
Unoccupied	Rock Creek	Nebraska Game & Parks Commission	152	29%
		Private	374	71%
		<i>Subtotal</i>	526	100%
	Oak Creek	Nebraska Department of Roads	30	14%
		City of Lincoln	178	86%
		<i>Subtotal</i>	208	100%
	Haines Branch <sup>a</sup>	BNSF Railway	7	8%
		City of Lincoln/State of Nebraska <sup>b</sup>	45	49%
		Private	40	43%
		<i>Subtotal</i>	92	100%
<b>Total</b>			<b>1,110</b>	

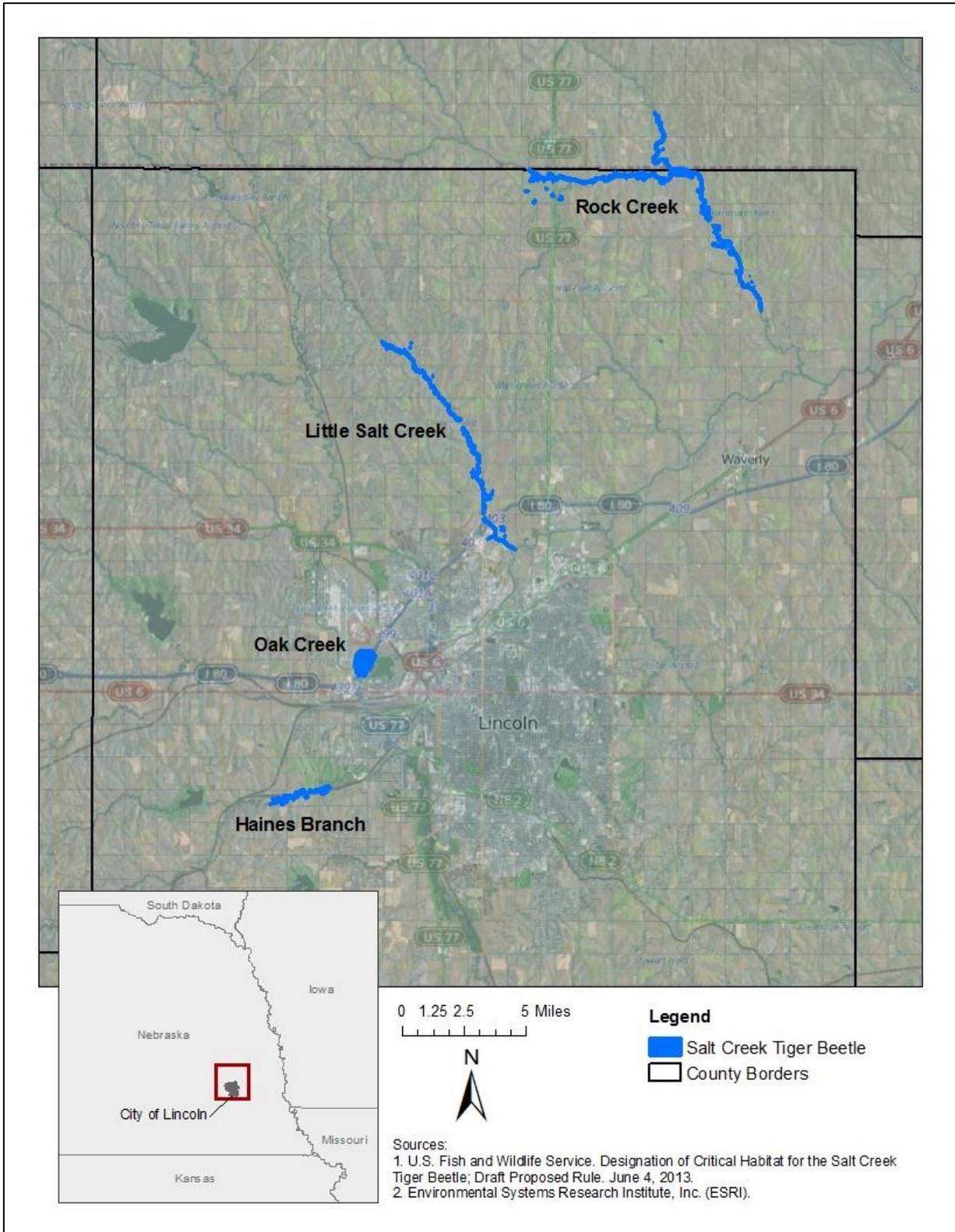
**Notes:**

a. Acreages for the Little Salt Creek, Rock Creek, and Oak Creek units are taken from: U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Revise Critical Habitat for the Salt Creek Tiger Beetle. December 6, 2013. Acreages for the Haines Branch unit were taken from: Lancaster County Assessor/Register of Deeds Office. Ownership Parcels. Received via email from Shaula Ross, GIS Specialist, Lower Platte South Natural Resources District on March 6, 2013.

b. Less than two acres of the proposed designation overlap a 219-acre parcel used as a shooting range by the Nebraska State Patrol. This small area of overlap may be due to inconsistencies in GIS map files.

<sup>10</sup> U.S. Fish and Wildlife Service. Nebraska Field Office, Regional Office, and Washington Office. Personal communication on December 5, 2013.

EXHIBIT 2. OVERVIEW OF PROPOSED BEETLE CRITICAL HABITAT



## SECTION 2. FRAMEWORK

Guidelines issued by the U.S. Office of Management and Budget (OMB) for the economic analysis of regulations direct Federal agencies to measure the costs and benefits of a regulatory action against a baseline (i.e., costs and benefits that are “incremental” to the baseline). OMB defines the baseline as the “best assessment of the way the world would look absent the proposed action.”<sup>11</sup> In other words, the baseline includes any existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users affected by the designation of critical habitat. The baseline includes the economic impacts of listing the species under the Act. Impacts that are incremental to the baseline (i.e., occurring over and above existing constraints) are those that are solely attributable to the designation of critical habitat. This screening analysis focuses on the likely incremental effects of the critical habitat designation.

We consider incremental effects of the designation in two key categories: 1) those that may be generated by section 7 of the Act; and 2) other types of impacts outside of the context of section 7:

- **Incremental section 7 impacts:** Activities with a Federal nexus that may affect listed species are subject to section 7 consultation to consider whether actions may jeopardize the existence of the species, even absent critical habitat.<sup>12</sup> As part of these consultations, critical habitat triggers an additional analysis evaluating whether an action will diminish the recovery potential or conservation value of the designated area. Specifically, following the designation, Federal agencies must also consider the potential for activities to result in the destruction or adverse modification of critical habitat. These consultations are the regulatory mechanism through which critical habitat rules are implemented. Any time and effort spent on this additional analysis, as well as the costs and benefits of implementing any recommendations resulting from this review, are economic impacts of the critical habitat designation.
- **Other incremental impacts:** Critical habitat may also trigger additional regulatory changes. For example, the designation may cause other Federal, state, or local permitting or regulatory agencies to expand or change standards or requirements. Regulatory uncertainty generated by critical habitat may also have impacts. For example, landowners or buyers may perceive that the rule will restrict land or water use activities in some way and therefore value the use of the land less than they would have absent critical habitat. This is a perceptual, or stigma, effect of critical habitat on markets.

Sections 3 and 4 of this memorandum describe incremental section 7-related impacts and “other” impacts, respectively. Of note, potential effects of the critical habitat rule on grazing land values are discussed in both sections. This is because grazing land values may be affected by the designation in two ways:

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<sup>11</sup> OMB, “Circular A-4,” September 17, 2003, available at [http://www.whitehouse.gov/omb/circulars\\_a004\\_a-4](http://www.whitehouse.gov/omb/circulars_a004_a-4). Circular A-4 provides “guidance to Federal Agencies on the development of regulatory analysis as required under Section 6(a)(3)(c) of Executive Order 12866...” (p. 1)

<sup>12</sup> A Federal nexus exists for activities authorized, funded, or carried out by a Federal agency.

1. **Recommendations for grazing restrictions result from intra-Service consultations on conservation partnerships.** The Service is seeking conservation partnerships with private landowners and, historically, conservation organization landowners have been amenable to these partnerships. In the case that conservation partnerships are established, we anticipate the Service will engage in inter-agency section 7 consultation and recommend constructing grazing exclosures to benefit the beetle and its habitat. Where the landowner previously leased land to farmers or ranchers for grazing and will preclude grazing due to the conservation partnership agreement, lessees may be negatively affected by the reduction in land available for grazing. We estimate this cost in terms of the reduced value of the lands that restrict grazing activities, as discussed in Section 3.
2. **Perceptual effects regarding anticipated grazing land use restrictions result in reduced land values.** Where the public perceives that critical habitat will preclude or restrict the use of lands for grazing, land values may be reduced regardless of whether restrictions are actually imposed. This may occur, for example, where private land is grazed and no Federal nexus exists compelling consultation. In the case that the public anticipates restrictions on land use, it may be less likely to purchase land in critical habitat or will pay a lesser value than for comparable land outside of critical habitat. These types of perceptual effects on private grazing land values are discussed in Section 4 of this memorandum.

### **SECTION 3. SECTION 7 COSTS OF THE CRITICAL HABITAT RULE**

In this section, we discuss the likelihood that the designation of critical habitat will result in incremental costs through the section 7 consultation process. In the baseline, section 7 of the Act requires Federal agencies to consult with the Service to ensure that their actions will not jeopardize the beetle. Once critical habitat is designated, section 7 also requires Federal agencies to ensure that their actions will not adversely modify critical habitat. Thus, in occupied habitat, a key focus of this screening analysis is whether the designation of critical habitat would trigger project modifications to avoid adverse modification that would be above and beyond any modifications triggered by adverse effects to the species itself. In unoccupied habitat, because project proponents would not consult with the Service absent the designation of critical habitat, all administrative and project modification costs resulting from the consultation process are incremental costs of the rule.

#### **IDENTIFYING INCREMENTAL COSTS IN OCCUPIED HABITAT**

In occupied habitat, incremental costs associated with section 7 consultations for the beetle are likely limited to administrative costs. This conclusion is based on multiple factors:

1. **The Federal listing status of the beetle as endangered provides substantial baseline protection.**
  - **All projects with a Federal nexus will be subject to section 7 requirements regardless of whether critical habitat is designated.**  
The Little Salt Creek unit is occupied by the species. This unit consists of

three existing beetle populations and the salt flats interspersed among these populations, which provide larval habitat and dispersal corridors.<sup>13</sup> Although these salt flats may not support existing, active populations, communication with land managers and review of past consultations for the beetle in this unit indicate that project proponents are aware of the need to consult with the Service regarding activities that may affect the beetle throughout the entire unit, including the salt flats.<sup>14</sup> Therefore, any activities along Little Salt Creek that have a Federal nexus will be subject to section 7 consultation requirements regardless of critical habitat designation.

- **Possible project modifications are unlikely to be affected by the designation of critical habitat.** In its incremental effects memorandum, the Service states that “[e]ven though the Service recognizes differences in the standards between avoidance of destruction or adverse modification and jeopardy, the types of project modifications that would be recommended would remain the same given the extremely low numbers and small number of populations of Salt Creek tiger beetles.”<sup>15</sup> That is, because the existence of the species is closely tied to the health of its habitat, the project modifications the Service would recommend to avoid jeopardy to the species would include habitat-related protections that would also avoid adverse modification of critical habitat. Thus, the designation of critical habitat in the Little Salt Creek unit is unlikely to generate recommendations for additional project modifications.

2. **The presence of the state-listed saltwort provides additional baseline protection.** Saltwort (*Salicornia rubra*) is listed as an endangered plant by the State of Nebraska.<sup>16</sup> The plant is found in the same saline wetland habitat as the beetle, and its documented range overlaps the entirety of the Little Salt Creek, Oak Creek, and Rock Creek units. Although saltwort is not federally listed, the Nebraska Game & Parks Commission notes that projects authorized, funded, or carried out by state agencies are required to undergo consultation to prevent jeopardy of state-listed species.<sup>17</sup> Since the saltwort depends on the same habitat as the beetle, any efforts to protect the saltwort may also benefit the beetle.

Thus, based on the substantial baseline protections afforded the beetle and the close relationship between adverse modification and jeopardy in occupied habitat, we do not forecast any incremental costs associated with project modifications in the Little Salt

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<sup>13</sup> 78 FR 33290-33291

<sup>14</sup> U.S. Fish and Wildlife Service. Nebraska Field Office, Regional Office, and Washington Office. Personal communication on December 5, 2013; and Hansen, Kirk. Biologist, Nebraska Game & Parks Commission. Personal communication on December 19, 2013.

<sup>15</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Revise Critical Habitat for the Salt Creek Tiger Beetle. December 6, 2013. (7)

<sup>16</sup> Nebraska Endangered and Threatened Species list. Endangered and Threatened Wildlife. Nebraska Game & Parks Commission. Accessed at: [http://outdoornebraska.ne.gov/wildlife/programs/nongame/Endangered\\_Threatened.asp](http://outdoornebraska.ne.gov/wildlife/programs/nongame/Endangered_Threatened.asp)

<sup>17</sup> Endangered and Threatened Wildlife. Nebraska Game & Parks Commission. Accessed at: [http://outdoornebraska.ne.gov/wildlife/programs/nongame/Endangered\\_Threatened.asp](http://outdoornebraska.ne.gov/wildlife/programs/nongame/Endangered_Threatened.asp)

Creek unit. Section 7 consultation costs are most likely limited to the additional administrative effort to consider adverse modification during the consultation process.

#### **IDENTIFYING INCREMENTAL COSTS IN UNOCCUPIED HABITAT**

The three remaining units (Oak Creek, Rock Creek, and Haines Branch) are not currently occupied by the beetle. In these units, project proponents are unlikely to initiate section 7 consultation absent the designation of critical habitat. As a result, all costs of consultation - including both administrative and project modification costs - for activities with a Federal nexus in these units are incremental impacts of the designation.

As noted above, however, the state-listed saltwort occupies the same saline wetland habitat as the beetle, and may be found in the Oak Creek and Rock Creek units. To the extent that the beetle co-occurs with saltwort, project modifications implemented for the plant may also provide conservation benefit to the beetle. Because we are unable to predict where future projects may overlap saltwort populations, for the purposes of this memorandum we assume that project modifications are implemented due to critical habitat designation for the beetle in these units. As a result, this screening analysis may overstate the incremental cost of project modifications attributable to the critical habitat designation.

#### **LIKELY MAGNITUDE OF INCREMENTAL COSTS**

To estimate the likely magnitude of incremental costs, we consider multiple data sources, including: the consultation history for the beetle; the results of stakeholder interviews; and information regarding historical expenditures on insect conservation provided by the U.S. Army Corps of Engineers (Corps). We find that incremental costs of section 7 consultation are likely to be less than \$540,000 (2013 dollars) in a given year. These costs include both administrative and project modification costs.

#### **Section 7 Consultation Forecast by Unit**

We project the intensity of future consultation activity using the historical rate of consultation. This consultation history (covering the period since the listing of the beetle in 2005) includes 28 informal consultations on activities such as bridge repair and replacement, highway improvements, habitat restoration, commercial development, pipeline operations, and creation of Wetland Reserve Program conservation easements. In addition, the Service participated in one statewide programmatic consultation with the Nebraska Department of Roads in 2012.<sup>18</sup>

Overall, the number of projects and activities requiring consultation across the proposed designation is expected to be relatively low. Although the proposed designation is located near the City of Lincoln, trends in future development, as projected in the Lincoln-Lancaster County Comprehensive Plan, indicate that development is most likely to occur to the south and east of the City of Lincoln, away from proposed critical habitat.<sup>19</sup>

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<sup>18</sup> U.S. Fish and Wildlife Service. Biologist, Nebraska Field Office. Personal communication on December 18 and December 19, 2013.

<sup>19</sup> LPlan 2040: Lincoln/Lancaster County 2040 Comprehensive Plan. Lincoln Metropolitan Planning Organization. October 31, 2011. Accessed at: <http://lincoln.ne.gov/city/plan/long/comp.htm> on January 3, 2014.

Additionally, the saline and wetland nature of the proposed designation makes the land unattractive for a variety of economic activities, including development, agriculture, and water projects.<sup>20</sup> Road crossings and limited grazing occur within the proposed designation, as reflected in the consultation history.<sup>21</sup>

In occupied habitat, where the designation of critical habitat is not expected to increase the frequency of consultation due to the need to consult in the baseline, we assume that the historical rate of consultation will continue. In unoccupied habitat where consultation activity will result from the designation of critical habitat, we rely on both the consultation history since the previous designation of critical habitat, as well as information provided via stakeholder outreach to forecast future consultation activity. Based on the consultation history and similar nature of forecasted projects and activities, future consultations will most likely be informal.<sup>22</sup>

#### Little Salt Creek Unit

Because Little Salt Creek is occupied by the beetle, we assume that the historical rate of consultation will continue. Since 2005, there have been 21 informal consultations in the Little Salt Creek Unit, 16 of which occurred since the designation of critical habitat in 2010. We estimate a future consultation rate of **four informal consultations per year** based on the consultation rate since 2010.<sup>23</sup>

#### Rock Creek Unit

The Rock Creek unit is not currently occupied by the beetle, but approximately 83 acres were previously designated as critical habitat in 2010. This unit consists of the Jack Sinn Memorial Wetland Management Area, which is managed by the Nebraska Game & Parks Commission, and privately owned parcels. The consultation history for this unit indicates that there have been four informal consultations since 2010, or approximately one per year. These consultations addressed a drainage modification, bridge replacement, bank stabilization, and the creation of a conservation easement. The previous designation of critical habitat in the Rock Creek unit encompassed a larger geographic area than the current proposal.

According to the Service and the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), the designation of critical habitat may provide new information that will help NRCS prioritize the establishment of conservation easements on private parcels in unoccupied habitat.<sup>24</sup> Conservation easements are established

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<sup>20</sup> U.S. Fish and Wildlife Service. Nebraska Field Office, Regional Office, and Washington Office. Personal communication on December 5, 2013.

<sup>21</sup> U.S. Fish and Wildlife Service. Biologist, Nebraska Field Office. Personal communication on December 18 and December 19, 2013.

<sup>22</sup> This assumption is supported by communication with key action agencies: Marinovich, Melissa. Highway environmental biologist, Nebraska Department of Roads. Personal communication on January 6, 2014; and Vaughn, Richard. Environmental Specialist, Natural Resources Conservation Service Nebraska State Office. Personal communication on December 18, 2013.

<sup>23</sup> Because the previous designation of critical habitat in the Little Salt Creek unit encompassed a larger geographic area than the current proposal, this rate may overstate the future rate of consultation.

<sup>24</sup> U.S. Fish and Wildlife Service. Incremental Effects Memorandum for the Economic Analysis of the Proposed Rule to Revise Critical Habitat for the Salt Creek Tiger Beetle. December 6, 2013. (6); and Vaughn, Richard. Environmental Specialist, Natural Resources Conservation Service Nebraska State Office. Personal communication on December 18, 2013.

voluntarily by private landowners through enrollment in the Wetland Reserve Program. As part of the Wetland Reserve Program, landowners receive NRCS funds to implement conservation and restoration activities on their lands. The creation of an easement typically requires informal section 7 consultation with the Service.<sup>25</sup>

To inform an estimate of the number of landowners that may enroll in the Wetland Reserve Program in the Rock Creek unit, we first determine the total number of privately owned parcels in each unit. We then assume that the percent of privately owned parcels that may participate is comparable to the percent that currently participate in easements in the occupied Little Salt Creek unit. Accordingly, as 22 percent of privately owned parcels in the Little Salt Creek unit are subject to existing easements, we assume that, in total, 22 percent of private parcels in the other three units will be subject to easements in the future. Accounting for existing easements in the unoccupied units, we forecast the creation of four new easements following the designation of beetle critical habitat in the Rock Creek unit. We therefore forecast four informal consultations for these easements.

Based on both the consultation history and the additional consultations associated with the possible conservation easements created, we estimate that up to **five consultations may occur in a single year** in the Rock Creek unit.

#### Oak Creek Unit

The Oak Creek unit consists of lands managed by the Lincoln Airport Authority (86 percent) and the corridor along Interstate 80 owned by the Nebraska Department of Roads (14 percent). Communication with the Lincoln/Lancaster County Planning Department indicated that future development of the lands managed by the Lincoln Airport Authority is unlikely, as these lands fall entirely within the floodplain.<sup>26</sup> Thus, no consultations are projected for these lands.

The lands owned by the Nebraska Department of Roads extend along Interstate 80 and may require consultation for highway maintenance and construction. These types of projects are likely to involve Federal funding, and would therefore have a nexus for section 7 consultation. Communication with the Department of Roads and review of the consultation history indicates that these consultations are typically conducted informally.<sup>27</sup> Although information forecasting the likely timing of future construction projects in this area is not available, based on the fact that proposed critical habitat overlaps only a small geographic area along a 1.1-mile stretch of interstate, we assume that the Department is unlikely to undertake more than one consultation in a given year. Therefore, this screening analysis conservatively estimates **one informal consultation in a given year** for highway projects in this unit.

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<sup>25</sup> Vaughn, Richard. Environmental Specialist, Natural Resources Conservation Service Nebraska State Office. Personal communication on December 18, 2013.

<sup>26</sup> Krout, Marvin. Director, Lincoln/Lancaster County Planning Department. Personal communication on December 10, 2013.

<sup>27</sup> Marinovich, Melissa. Highway environmental biologist, Nebraska Department of Roads. Personal communication on January 6, 2014.

### Haines Branch Unit

The Haines Branch unit includes approximately 44 acres of Pioneers Park, a nature center and wildlife sanctuary managed by the City of Lincoln Parks & Recreation Department. The City intends to use funds from the Federal Recreational Trails Program for the construction of a nature trail through Pioneers Park.<sup>28</sup> This project may therefore have a nexus for section 7 consultation.

The Haines Branch unit also includes lands owned by BNSF Railway.<sup>29</sup> The railroad crosses the creek in one location and overlaps approximately seven acres of the proposed designation. BNSF Railway has no foreseeable development planned for this area, however.<sup>30</sup> As a result, we do not forecast any consultations associated with railroad activities.

The remaining acres in this unit are privately owned.<sup>31</sup> Applying the method described above for the Rock Creek Unit, we forecast the creation of one new NRCS easement in this unit. Therefore, for the Haines Branch unit, we conservatively forecast **up to two informal consultations in a single year** for trail creation in Pioneers Park and the creation of one conservation easement.

### Administrative Costs of Section 7 Consultations

We find that the annual number of future informal consultations is most likely to be fewer than 12. Applying the per-consultation costs in Exhibit 3 results in total incremental administrative costs of approximately \$67,000 in a given year.<sup>32</sup>

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<sup>28</sup> Fleck-Tooze, Nicole. Special Projects Administrator, City of Lincoln Parks & Recreation Department. Personal communication on January 3, 2014.

<sup>29</sup> Formerly known as the "Burlington Northern and Santa Fe Railway," in 2005 the railway officially changed its name to "BNSF Railway." (BNSF Historical Overview. Accessed at: <http://www.bnsf.com/about-bnsf/our-railroad/company-history/> on January 31, 2014.)

<sup>30</sup> Athey, R. Mark. Lincoln Terminal Superintendent, BNSF Railway. Personal communication on January 12, 2014.

<sup>31</sup> Less than two acres of the proposed designation overlap a 219-acre parcel used as a shooting range by the Nebraska State Patrol. This small area of overlap may be due to inconsistencies in GIS map files. Regardless, the portion of the parcel that overlaps the proposed designation is located away from the active shooting range and all developed areas of the parcel. Therefore, we assume section 7 consultation is unlikely to be required for activities on State Patrol lands.

<sup>32</sup> \$74,000 = (4 informal consultations in occupied habitat) \* (\$2,400 incremental cost per consultation) + (9 informal consultations in unoccupied habitat) \* (\$7,100 incremental cost per consultation)

EXHIBIT 3. RANGE OF INCREMENTAL ADMINISTRATIVE CONSULTATIONS COSTS (2013\$)

CONSULTATION TYPE	SERVICE	FEDERAL AGENCY	THIRD PARTY	BIOLOGICAL ASSESSMENT	TOTAL COSTS
<b>ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (OCCUPIED HABITAT)</b>					
Technical Assistance	\$140	n/a	\$260	n/a	\$410
Informal	\$610	\$780	\$510	\$500	\$2,400
Formal	\$1,400	\$1,600	\$880	\$1,200	\$5,000
Programmatic	\$4,200	\$3,500	n/a	\$1,400	\$9,000
<b>NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)</b>					
Technical Assistance	\$430	n/a	\$790	n/a	\$1,200
Informal	\$1,900	\$2,300	\$1,500	\$1,500	\$7,100
Formal	\$4,100	\$4,700	\$2,600	\$3,600	\$15,000
Programmatic	\$12,000	\$10,000	n/a	\$4,200	\$27,000
Source: IEC analysis of administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2013, and a review of consultation records from several Service field offices across the country conducted in 2002.					
Notes:					
1. Estimates are rounded to two significant digits and may not sum due to rounding.					
2. Estimates reflect average hourly time required by staff.					

**Project Modification Costs**

This section describes the potential for project modifications associated with the designation of critical habitat. Consultations on transportation projects and voluntary conservation partnerships may generate requests for project modifications, as follows:

- Transportation projects:** Based on historic project modification requests in occupied habitat, the Service may recommend: installing a temporary shoring wall for erosion control along the creek; biological monitoring; addition of silt fences; modifications to highway median design to reduce project footprint; and changes to lighting design.
- Limitations on grazing activities:** In addition to the consultations and activities described above, we note that, in occupied critical habitat, the Service has historically partnered with landowners for the purposes of beetle conservation. These voluntary partnerships, which may result in an intra-agency consultation for the Service, have resulted in landowners limiting grazing activities on their lands overlapping known populations of the beetle. Although grazing may benefit the beetle by controlling invasive vegetation and maintaining its habitat, grazing may also result in the trampling of larval habitat.<sup>33</sup> The Service has accordingly worked with landowners, such as the Nebraska Game & Parks Commission, to

<sup>33</sup> U.S. Fish and Wildlife Service. Biologist, Nebraska Field Office. Personal communication on December 19, 2013.

voluntarily install fencing around active populations.<sup>34</sup> These grazing exclosures are typically less than one acre in size.

Similarly, the Service intends to seek voluntary partnerships with agency and conservation group landowners in unoccupied habitat to reintroduce populations of the beetle in these units. Such efforts may require an intra-agency section 7 consultation by the Service.<sup>35</sup> As a result of these partnerships, the agency and conservation group landowners may preclude grazing on all or some portion of their lands that are currently leased to private farmers and ranchers. As a result, the farmers and ranchers may incur costs associated with a reduction in their overall level of grazing activity. This analysis evaluates whether limiting grazing in areas that may be subject to voluntary conservation partnerships (i.e., agency and conservation group lands) may have an effect on the economy of \$100 million or more in a given year.

We find that project modifications, including changes to transportation projects and grazing activities, are unlikely to exceed \$470,000 in a given year. These findings are described by unit below.

#### Little Salt Creek Unit

The consultations forecast in this occupied unit are unlikely to generate additional project modifications for the reasons described above. Furthermore, as the beetle already exists in this unit, and existing partnerships preclude grazing activities on agency and conservation group lands, we do not anticipate that future consultations will generate additional recommendations for grazing restrictions.

#### Rock Creek Unit

We forecast up to five informal consultations in the Rock Creek unit in a given year. Four of these consultations are expected to address the creation of new conservation easements for the NRCS Wetland Reserve Program. The creation of new easements is unlikely to require additional project modifications for the beetle or its habitat due to the conservation focus of the program.<sup>36</sup> The fifth consultation expected to occur in this unit is implied by the historical consultation rate. Because we cannot predict the focus of this consultation, we are unable to estimate project modification costs.

We also consider the potential for land use changes following possible reintroduction of the beetle through voluntary partnerships in this unoccupied unit. To determine whether grazing restrictions may generate an effect on the economy of \$100 million or more in a given year, we conduct a bounding analysis of costs associated with possible grazing exclosures. That is, we estimate the economic implications of precluding grazing on all lands available for grazing that may be subject to partnership agreements with the Service

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<sup>34</sup> Hansen, Kirk. Biologist, Nebraska Game & Parks Commission. Personal communication on December 19, 2013.

<sup>35</sup> We do not project consultations associated with possible reintroduction efforts due to uncertainty regarding their occurrence. However, as the consultations would most likely be intra-agency efforts, administrative costs would most likely be borne by the Service.

<sup>36</sup> Vaughn, Richard. Environmental Specialist, Natural Resources Conservation Service Nebraska State Office. Personal communication on December 18, 2013.

(i.e., agency and conservation group lands). As noted above, the Service does not intend to recommend precluding grazing across the entirety of critical habitat.

The landowner in this unit most likely to engage in conservation partnerships with the Service to support reintroduction of the beetle is the Nebraska Game & Parks Commission. We identify 152 acres owned by the Nebraska Game & Parks Commission where grazing restrictions could be implemented. Assuming this land is or may be leased for the purposes of grazing, our bounding analysis estimates land value losses in the case that reintroduction of the beetle precludes grazing from occurring. These land value losses serve as a proxy for the possible impact to the farmers and ranchers that would otherwise lease the land.

We employ data from the U.S. Department of Agriculture's 2013 report on agricultural land values for this analysis.<sup>37</sup> The average value of pastureland in Nebraska is \$700 per acre. Given that the entirety of the proposed designation is located within wetlands and riparian areas, which are generally less desirable for grazing, the statewide average is likely a conservative estimate of actual grazing land value.<sup>38</sup> Multiplying this per-acre land value by 152 acres indicates that the high end cost of grazing restrictions in this unit is most likely **less than \$110,000**.

#### Oak Creek Unit

We forecast one informal consultation in the Oak Creek Unit in a given year. This consultation considers construction or maintenance of Interstate 80. As reported in the 2010 Final Economic Analysis of Critical Habitat Designation for Salt Creek Tiger Beetle, the 2007 widening of Interstate 80 over Little Salt Creek resulted in approximately \$360,000 in project modifications for the purpose of beetle conservation.<sup>39</sup> These project modifications included construction of a temporary shoring wall for erosion control along the creek; biological monitoring; addition of silt fences; modifications to the highway median design to reduce project footprint; and changes to lighting design.<sup>40</sup> We assume that a similar suite of modifications may be incurred for highway construction projects along Interstate 80 in the Oak Creek unit. Because the 2007 bridge widening was a major construction project, and a relatively small stretch of highway intersects the Oak Creek unit, we expect that the cost of modifications to that project represents a high-end cost of project modifications that could be requested for the forecast transportation consultation. We therefore forecast incremental costs of less than **\$360,000 in a single year** for highway projects in the Oak Creek unit.

Although these types of project modifications may vary based on project size and location, communication with the Department of Roads indicated that the Department

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<sup>37</sup> U.S. Department of Agriculture, National Agricultural Statistics Service. 2013. *Land Values: 2013 Summary*.

<sup>38</sup> Communication with the Nebraska Game & Parks Commission indicated that grazing lands within wetlands and flood-prone areas may be less desirable to farmers and ranchers, due to the risk of flooding and difficulty of accessing the area. Lesiak, Chuck. Biologist, Nebraska Game & Parks Commission. Personal communication on December 17, 2013.

<sup>39</sup> These values are inflated from 2007 dollars to 2013 dollars using Table 1.1.9. Implicit Price Deflators for Gross Domestic Product. National Income and Product Accounts Tables. Bureau of Economic Analysis. Accessed at: <http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1#reqid=9&step=1&isuri=1> on January 9, 2014.

<sup>40</sup> Entrix, Inc. Final Economic Analysis of Critical Habitat Designation for Salt Creek Tiger Beetle. April 14, 2010. (75)

typically tries to avoid construction within wetlands. Additionally, the Department has developed, in conjunction with the Nebraska Game & Parks Commission and the Service, standard conservation measures for the beetle and its habitat that may be implemented for projects in the Oak Creek unit. These measures may be implemented regardless of the designation of critical habitat due to the general sensitivity of wetland habitat and are similar to those included in the cost estimate described above (including lighting modifications and debris capture along streams).<sup>41</sup> In the case that the Department of Roads implements the established standard conservation measures absent critical habitat designation, this analysis overstates the impacts of critical habitat designation.

Because grazing does not occur in this unit, we do not forecast any costs associated with grazing restrictions.

#### Haines Branch Unit

In the Haines Branch unit, we forecast up to two informal consultations in a single year: one for trail creation in Pioneers Park, and one for the creation of a conservation easement. Given Pioneer Park's role as a nature center and wildlife sanctuary, and its focus on conservation and environmental education, we do not anticipate that the forecast consultation for trail development would result in project modifications.<sup>42</sup> Similarly, as described above for the Rock Creek unit, the creation of new NRCS conservation easements is unlikely to require additional project modifications for the beetle or its habitat due to the conservation focus of the NRCS Wetland Reserve Program.<sup>43</sup>

We also consider costs associated with grazing restrictions following possible reintroduction of the beetle. We identify Pioneers Park as the only portion of this unit owned by an entity with a conservation focus that may enter into a conservation partnership with the Service. Because grazing does not occur within the portion of the park proposed as critical habitat, we do not forecast any costs associated with grazing restrictions following possible reintroduction of the beetle in the Haines Branch unit.<sup>44</sup>

#### Comparison to Corps Expenditures

This screening analysis estimates less than \$540,000 in section 7-related incremental costs in a given year following the designation of critical habitat, including both administrative and project modification costs. Because of the location of the proposed designation in wetland and riparian areas, we expect the Corps may initiate a portion of the consultation activity. We therefore reference information on historical expenditures

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<sup>41</sup> Marinovich, Melissa. Highway environmental biologist, Nebraska Department of Roads. Personal communication on January 6, 2014.

<sup>42</sup> Pioneers Park Nature Center. Lincoln Parks & Recreation. Accessed at: <http://lincoln.ne.gov/city/parks/naturecenter/> on January 9, 2014.

<sup>43</sup> Vaughn, Richard. Environmental Specialist, Natural Resources Conservation Service Nebraska State Office. Personal communication on December 18, 2013.

<sup>44</sup> The City of Lincoln leases some land for grazing in the northern section of Pioneer Park, away from critical habitat. The park also grazes nine park-owned American bison in an enclosure in the southern section of the park. This enclosure is adjacent to, but not within, critical habitat. Fass, Andrea. Naturalist, Pioneer Park Nature Center, City of Lincoln. Personal communication on January 16, 2014.

provided by the Corps to assess the reasonableness of costs estimated in this screening memorandum.

In August 2013, the Corps compiled a technical report summarizing its expenditures for compliance with the Act. This report includes national data on the costs of coordinating and consulting with the Service and implementing conservation measures, including equipment modifications, infrastructure construction and operation, species and habitat monitoring, and land acquisition.<sup>45</sup> Costs are tracked for fiscal years 2005 through 2010, and are presented by major taxa, as well as for key species.

This report indicates that, for all endangered and threatened insect species, the Corps has spent less than \$2.8 million per year since 2005. For three of the six years included in the Corps report, the Corps spent less than \$1.0 million.<sup>46</sup> Because these estimates encompass both administrative and project modification costs for all insect species nationwide, it is unlikely that the Corps' cost to protect critical habitat for the beetle would result in incremental costs exceeding \$100 million in a given year.

#### **SECTION 4. OTHER COSTS OF THE CRITICAL HABITAT RULE**

This section discusses the potential for incremental costs to occur outside of the section 7 consultation process. These types of costs include triggering additional requirements or project modifications under state laws or regulations, and perceptual effects on markets. These types of impacts may occur even when activities do not have a Federal nexus for consultation.

##### **ADDITIONAL STATE REGULATION**

Incremental costs may occur outside of the section 7 consultation process if the designation of critical habitat triggers additional requirements or project modifications under state or local laws, regulations, or management strategies. These types of costs typically occur if the designation increases awareness of the presence of the species or the need for protection of its habitat. Such costs may occur even when activities do not have a Federal nexus for consultation.

As described in previous sections of this memorandum, the beetle has been listed under the Act since 2005. In occupied areas, we therefore assume that the designation of critical habitat will not provide new information about the need to conserve the species and its habitat.

Additionally, most activities occurring within beetle critical habitat could have a nexus for section 7 consultation due to the location of the proposed designation in wetlands or riparian areas and the likely requirement for a section 404 permit from the Corps. Communication with the Corps indicates that the Corps is familiar with all units proposed for designation and the need to consult with the Service.<sup>47</sup> Therefore, impacts associated

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<sup>45</sup> Henderson, Jim E. August 2013. Costs Associated with Endangered Species Act Compliance. Dredging Operations Technical Support Technical Notes Collection ERDC/TN EEDP-06-23. Vicksburg, MS: U.S. Army Engineer Research and Development Center. Accessed at: <http://el.erd.c.usase.army/dots>.

<sup>46</sup> *Ibid.* (9)

<sup>47</sup> U.S. Fish and Wildlife Service. Summary of outreach to Federal agencies, conducted on April 4, 2013, provided by the Service via email communication on December 14, 2013.

with the designation of critical habitat are most likely to occur within the section 7 consultation process.

#### **POSSIBLE IMPACTS OF PUBLIC PERCEPTION**

Comments received regarding proposed designations of critical habitat in various locations throughout the United States indicate that the public perceives critical habitat designation as possibly resulting in incremental changes to private property values, above and beyond those associated with specific forecast project modifications under section 7 of the Act.<sup>48</sup> These commenters believe that, all else being equal, a property that is inhabited by a threatened or endangered species, or that lies within a critical habitat designation, will have a lower market value than an identical property that is not inhabited by the species or that lies outside of critical habitat. This lower value results from the perception that critical habitat will preclude, limit, or slow development, or somehow alter the highest and best use of the property. Public attitudes about the limits and costs that the Act may impose can cause real economic effects to the owners of property, regardless of whether such limits are actually imposed. Over time, as public awareness grows of the regulatory burden placed on designated lands, particularly where no Federal nexus compelling section 7 consultation exists, the effect of critical habitat designation on properties may subside.

In the case of proposed critical habitat for the beetle, the habitat is located in areas where development pressure is low, and where land use activities are limited by the saline wetland nature of the lands. Thus, the value of private lands within the proposed designation is likely to be driven by their next best use, for grazing. Despite the fact that a section 7 nexus is unlikely for grazing activities conducted on private acres, the farming and ranching community may perceive that the designation of certain parcels as critical habitat will limit future grazing activities in those areas.

To evaluate the possible magnitude of such costs, we conduct a bounding analysis. Our analysis estimates the market value for privately owned grazing lands within the proposed designation. Public perception may diminish land values by some percent of these total values. While data limitations prevent us from estimating the size of this percent reduction or its attenuation rate, any perceptual effects on a property cannot reduce the value of the property by more than its total market value. Assuming the entire value of the parcel is lost will likely overstate costs because many properties may have alternative uses that the public would not construe as “lost” (e.g., land that is currently used for grazing could be used for recreational purposes).

The total market value of grazing lands represents the upper bound on possible costs rather than a best estimate of likely costs. Assuming the entire value of these lands (i.e., all economic activity associated with the parcel) is lost would likely overstate impacts and is not supported by the limited, existing academic literature investigating endangered

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<sup>48</sup> See, for example, public comments on the possible impact of designating private lands as critical habitat for the Northern spotted owl (as summarized in Industrial Economics, Incorporated. *Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl: Final Report*. Prepared for the U.S. Fish and Wildlife Service. November 20, 2012. (p. 5-21) and the cactus ferruginous pygmy owl (as summarized in Industrial Economics, Incorporated. *Economic Analysis of Critical Habitat Designation for the Cactus Ferruginous Pygmy-Owl*. Prepared for the U.S. Fish and Wildlife Service. June 1999. p. 44)).

species-related public perception effects.<sup>49</sup> In addition, these properties may experience similar perception-related effects for other reasons, including the presence of the listed beetle and the state-listed saltwort, reducing the incremental portion of the impact attributable to beetle critical habitat.

To estimate the value of privately owned grazing lands within the proposed designation, we first identify the number and location of acres within proposed critical habitat that could be reasonably subject to perceptual effects. Then, we estimate the current market value of these acres using state-level pastureland valuation data from the U.S. Department of Agriculture.<sup>50</sup> We identify 519 acres of privately owned land within the proposed designation (occupied and unoccupied habitat) that are not currently held in conservation easements. This excludes those acres that may support grazing on lands potentially subject to conservation partnerships, as described and quantified in Section 3. We conclude that the total value of these lands is unlikely to exceed \$100 million.<sup>51</sup>

#### **SECTION 5. GEOGRAPHIC DISTRIBUTION OF SECTION 7 AND OTHER COSTS**

Using available data on consultation and project forecasts, we identify the units likely to incur the largest share of incremental costs. As shown in Exhibit 5 below, the greatest incremental costs are expected in the Oak Creek unit. These costs are driven primarily by project modifications for possible highway projects. Additionally, we consider the potential for land value losses in the Rock Creek unit if grazing restrictions occur. Finally, we consider the implications of perceptual effects on privately owned lands in all units (except Oak Creek, which does not overlap any privately owned lands), based on land ownership and land use information. Exhibit 4 summarizes forecast incremental costs in all units.

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<sup>49</sup> For a discussion of the available literature describing possible perceptual effects resulting from the Act, see Industrial Economics, Incorporated. Memorandum to the U.S. Fish and Wildlife Service, Supplemental Information on Perceptual Effects on Grazing - Critical Habitat Designation for the Salt Creek Tiger Beetle. February 5, 2014.

<sup>50</sup> U.S. Department of Agriculture, National Agricultural Statistics Service. 2013. *Land Values: 2013 Summary*.

<sup>51</sup> For additional detail describing our analysis of perceptual effects, see Industrial Economics, Incorporated. Memorandum to the U.S. Fish and Wildlife Service, Supplemental Information on Perceptual Effects on Grazing - Critical Habitat Designation for the Salt Creek Tiger Beetle. February 5, 2014.

**EXHIBIT 4. SUMMARY OF INCREMENTAL COSTS BY UNIT (2013\$)**

UNIT	NUMBER OF CONSULTATIONS IN A GIVEN YEAR	ADMINISTRATIVE COSTS	PROJECT MODIFICATION COSTS	TOTAL COSTS	DESCRIPTION
Little Salt Creek	4	\$9,500	\$0	\$9,500	<ul style="list-style-type: none"> <li>• Consultations based on historical consultation rate</li> <li>• Possible perceptual effects on private lands</li> </ul>
Rock Creek	5	\$36,000	\$110,000	\$140,000	<ul style="list-style-type: none"> <li>• Consultations based on historical consultation rate and possible NRCS easements</li> <li>• Land value losses due to possible grazing exclosures</li> <li>• Possible perceptual effects on private lands</li> </ul>
Oak Creek	1	\$7,100	\$360,000	\$370,000	<ul style="list-style-type: none"> <li>• Consultation and project modifications for one highway project</li> </ul>
Haines Branch	2	\$14,000	\$0	\$14,000	<ul style="list-style-type: none"> <li>• Consultations for city park and possible NRCS easement</li> <li>• Possible perceptual effects on private lands</li> </ul>
<b>Total</b>	<ul style="list-style-type: none"> <li>• 4 in occupied habitat</li> <li>• 8 in unoccupied habitat</li> </ul>	<b>\$67,000</b>	<b>\$470,000</b>	<b>\$540,000</b>	

**Notes:**

1. Estimates are rounded to two significant digits and may not sum due to rounding.
2. For additional detail describing our identification of acres most likely to be subject to perceptual effects and the value of these acres, see Industrial Economics, Incorporated. Memorandum to the U.S. Fish and Wildlife Service on “Supplemental Information on Perceptual Effects - Critical Habitat Designation for the Salt Creek Tiger Beetle.” February 5, 2014.

**SECTION 6. SECTION 7 AND OTHER ECONOMIC BENEFITS**

The primary intended benefit of critical habitat is to support the conservation of threatened and endangered species, such as the beetle. As described in the previous sections of this memorandum, the designation may result in incremental project modifications for the beetle, including erosion control and grazing exclosures in areas not currently occupied by the species. Various economic benefits may result from these incremental project modifications, including: (1) those associated with the primary goal of species conservation (i.e., direct benefits), and (2) those additional beneficial services that derive from project modifications but are not the purpose of the Act (i.e., ancillary benefits).

In order to quantify and monetize direct benefits of the designation, information is needed to determine (1) the incremental change in the probability of beetle conservation expected to result from the designation (distinct from the change in conservation probability

associated with the listing of the species), and (2) the public's willingness to pay for such beneficial changes.

Numerous published studies estimate individuals' willingness to pay to protect endangered species.<sup>52</sup> However, information on the expected change in beetle population levels that may result from critical habitat designation is not available. Even if this information existed, the published valuation literature does not support monetization of incremental changes in conservation probability for the beetle.<sup>53</sup>

Ancillary benefits may also be achieved through the designation of critical habitat. For example, the public may hold a value for habitat conservation, beyond its willingness to pay for conservation of a specific species. Studies have been undertaken to estimate the public's willingness to pay to preserve wilderness areas, for wildlife management and preservation programs, and for wildlife protection in general. Similarly, economists have conducted research on the economic value of benefits such as the preservation of open space, which may positively affect the value of neighboring parcels, or maintenance of natural hydrologic functions of an ecosystem, which may result in improved downstream water quality. For example, a 2006 report evaluated the potential for environmental amenities to contribute to economic growth in Nebraska. This report concluded that willingness to pay for the preservation of areas capable of producing recreational and environmental amenities, including the protection of rare species, could be significant, in some cases exceeding the value of alternative land uses.<sup>54</sup> The report also provided specific examples of benefits associated with the preservation of wetland and riparian areas, such as flood control, water filtration, water storage, and enhanced recreational opportunities.<sup>55</sup>

Although such studies provide information on the types of benefits that may derive from conservation of beetle habitat, additional information would be required to establish the incremental benefits associated with the critical habitat designation (e.g., the marginal change in the value of these environmental amenities specifically driven by the critical habitat rule). Due to existing data limitations, we are unable to assess the possible magnitude of such benefits.<sup>56</sup>

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<sup>52</sup> See, for example, Loomis, J.B. and Douglas S. White. 1996. Economic Benefits of Rare and Endangered Species: Summary and Meta-Analysis. *Ecological Economics*, 18(3): 197-206.

<sup>53</sup> Numerous published studies estimate individuals' willingness to pay to protect endangered species. The economic values reported in these studies reflect various groupings of benefit categories. For example, these studies assess public willingness to pay for wildlife-viewing opportunities, for the option for seeing or experiencing the species in the future, to assure that the species will exist for future generations, and simply knowing a species exists, among other values. Unfortunately, this literature addresses a relatively narrow range of species and circumstances compared to the hundreds of species and habitats that are the focus of the Act. Specifically, existing studies focus almost exclusively on large mammal, bird, and a few fish species, and generally do not report values for incremental changes in species conservation. Importantly for this analysis, no studies estimate the value the public places on preserving insects such as the beetle.

<sup>54</sup> ECONorthwest. August 2006. *Natural-Resource Amenities and Nebraska's Economy: Current Connections, Challenges, and Possibilities*. (91)

<sup>55</sup> *Ibid.* (41-43)

<sup>56</sup> For a detailed discussion of these data limitations, see Flight, M. and R. Unsworth, Industrial Economics, Incorporated. 2011. *Quantifying Benefits of Critical Habitat Designation for Listed Species*. Memorandum to Douglas Krofta, U.S. Fish and Wildlife Service.

We therefore provide a qualitative summary of the categories of benefits that may result from implementation of the incremental project modifications described in this memorandum (Exhibit 5). In addition to the benefits listed in Exhibit 5, the maintenance or enhancement of use and non-use values for coexisting species, or for biodiversity in general, may also result from the implementation of incremental project modifications for the beetle.

**EXHIBIT 5. POSSIBLE INCREMENTAL PROJECT MODIFICATIONS FOR THE BEETLE AND ASSOCIATED BENEFITS**

POSSIBLE INCREMENTAL PROJECT MODIFICATION	ASSOCIATED BENEFITS	RELEVANT UNITS
Erosion control for highway and railroad projects	<ul style="list-style-type: none"> <li>• Improved water and soil quality via reduced erosion</li> <li>• Ecosystem health for coexisting species</li> </ul>	Oak Creek, Haines Branch
Biological monitoring	<ul style="list-style-type: none"> <li>• Educational and scientific benefits</li> </ul>	Oak Creek, Haines Branch
Use of silt fences for highway and railroad bridge projects	<ul style="list-style-type: none"> <li>• Improved water quality</li> <li>• Ecosystem health for coexisting species</li> </ul>	Oak Creek, Haines Branch
Minimization of project footprint for highway and railroad bridge projects	<ul style="list-style-type: none"> <li>• Improved water and soil quality</li> <li>• Ecosystem health for coexisting species</li> </ul>	Oak Creek, Haines Branch
Modifications to lighting design for highway and railroad bridge projects	<ul style="list-style-type: none"> <li>• Ecosystem health for coexisting species</li> </ul>	Oak Creek, Haines Branch
Grazing exclosures	<ul style="list-style-type: none"> <li>• Improved water and soil quality</li> <li>• Ecosystem health for coexisting species</li> </ul>	Rock Creek
<p><b>Note:</b> All project modifications are intended to support the survival and/or recovery of the species.</p>		

**SECTION 7. SUMMARY**

In conclusion, the section 7-related costs of designating critical habitat for the beetle are likely to be relatively low given the limited economic activity occurring in many of the proposed areas. In occupied habitat, incremental costs are limited to additional administrative effort to consider adverse modification in consultation. This finding is based on several factors, including:

1. The presence of the species results in significant baseline protection under the Act;
2. The Service believes that project modifications requested to avoid adverse modification are likely to be the same as those needed to avoid jeopardy to the species;

3. An increase in awareness of the need to consult with the Service is unlikely given the listing of the species in 2005; and
4. The proposed designation also receives baseline protection from the presence of the state-listed endangered saltwort, a plant species with similar habitat needs.

In unoccupied habitat, where project proponents would not consult with the Service absent the designation of critical habitat, incremental costs include all administrative and project modification costs resulting from section 7 consultation.

The incremental costs resulting from the designation are unlikely to reach \$100 million in a given year based on the number of anticipated consultations and per-consultation administrative and project modification costs. Furthermore, costs of perceptual effects will not reach \$100 million in a given year, based on the amount and value of grazing land within the proposed designation.

Additional efforts to conserve the beetle are anticipated in unoccupied habitat. These changes in future land use may result in benefits to the species and environmental quality. Due to existing data limitations, we are unable to assess the possible magnitude of such benefits.

In summary, critical habitat for the beetle will not generate costs exceeding \$100 million in a single year. The magnitude of benefits is highly uncertain, and quantification would require primary research and the generation of substantial amounts of new data, which is beyond the scope of this memorandum and Executive Order 12866.<sup>57</sup>

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<sup>57</sup> Executive Order 12866 directs agencies to base regulatory decisions on “the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation” (58 FR 51736). For a detailed discussion of data limitations associated with the estimation of critical habitat benefits, see Flight, M. and R. Unsworth, Industrial Economics, Incorporated. 2011. *Quantifying Benefits of Critical Habitat Designation for Listed Species*. Memorandum to Douglas Krofta, U.S. Fish and Wildlife Service.