



ECONOMIC ANALYSIS OF  
CRITICAL HABITAT  
DESIGNATION FOR *Catesbaea*  
*Melanocarpa*

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prepared for:

Division of Economics  
U.S. Fish and Wildlife Service  
4401 N. Fairfax Drive  
Arlington, VA 22203

prepared by:

Industrial Economics, Incorporated  
2067 Massachusetts Avenue  
Cambridge, MA 02140

**SUMMARY**

1. The purpose of this report is to identify and analyze the potential economic impacts associated with proposed critical habitat for *Catesbaea melanocarpa*, a spiny shrub species native to the Caribbean. The U.S. Fish and Wildlife Service (Service) listed *C. melanocarpa* as endangered on March 17, 1999 and published a critical habitat proposal for the species on August 22, 2006.<sup>1</sup> The proposed unit encompasses 50 acres of currently undeveloped, privately owned land on St. Croix, U.S. Virgin Islands.<sup>2</sup>
2. The primary objectives of this economic analysis are to:
  - Provide background information on the land's ownership and local regulations governing its use.
  - Estimate, within a range, the land's current market value absent limitations on development due to critical habitat.
  - Identify potential limitations on development due to critical habitat and estimate, within a range, the cost of these limitations to landowners.
3. The landowner of the proposed critical habitat area states that "no development is presently planned for the Property which would threaten or impact the existing population of this Species."<sup>3</sup> Nonetheless, given the potential for changes in future land use due to the presence of the species, this economic analysis considers the potential property value impacts that could result from limitations on future development of the designated property. No economic impacts are associated with limitations on livestock grazing or human-induced fires, although the Proposed Rule identifies these activities as threats to the species. Both of these activities are discussed at the end of the analysis. A more detailed description of the scope of the analysis and the methodology for estimating economic impacts can be found in Appendix A.

**BACKGROUND: PARCEL OWNERSHIP AND LOCAL REGULATIONS**

4. The 50 acres proposed for critical habitat are located due south of Christiansted, St. Croix, less than a kilometer from Halfpenny Bay. Exhibit 1 shows an aerial photograph of the site, including the approximate distribution of the estimated 100 *C. melanocarpa* individuals.<sup>4</sup> The boundaries of the proposed unit largely mirror the boundaries of a single 75-acre property managed by the Virgin Islands Title and Trust Company.<sup>5</sup> The

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<sup>1</sup> The U.S. Virgin Islands Endangered and Indigenous Species Act of 1990 also prohibits the take or destruction of *Catesbaea melanocarpa*. The specific prohibitions of the Act can be viewed at U.S. Virgin Islands, Division of Fish and Wildlife, <http://www.vifishandwildlife.com/Education/EndangeredSp/EndIndSpAct.htm>

<sup>2</sup> *C. melanocarpa* also exists on Puerto Rico in the Guánica and Susúa Commonwealth forests. The Proposed Rule does not suggest these areas for critical habitat designation, because they are currently protected by law.

<sup>3</sup> Public comment of J.H. Isherwood, Isherwood and Isherwood, P.C. "RE: Second Presentation of public comments related to proposed rulemaking with respect to *Catesbaea melanocarpa*." Dated April 13, 2007.

<sup>4</sup> Proposed Rule; Designation of Critical Habitat for *Catesbaea melanocarpa*. 71 Federal Register 48883-48899. August 22, 2006.

<sup>5</sup> The Virgin Islands Title and Trust Company oversees the property, although it is owned by several individual landowners.

square cut in the northwestern boundary was sold in 1989 to Marbella North, Inc., a residential developer based in Maryland.<sup>6</sup> The winding cut in the southeastern boundary of the proposed unit follows a steep change in the land's elevation; the actual southern boundary of the property extends to the beach.<sup>7</sup>

5. The Virgin Islands Title and Trust Company was established in the late 1960s by a group planning to construct a hotel, golf course, and condominiums on the property. The plans were never realized, and since then relatives of the original stakeholders in the venture have inherited the property.<sup>8</sup> The property is subject to an agricultural lease that has not been terminated, and is periodically grazed by livestock.<sup>9</sup> The owner notes that this grazing activity reduces the threat of brush fires and may benefit the species.<sup>10</sup>
6. The Territory has zoned the land as "District 2: Low Intensity" which permits low density residential construction and small-scale agriculture. This zoning category allows a maximum of four residential units per acre for single and multi-family construction and a maximum of six units per acre for larger-scale condominium and hotel developments.<sup>11</sup> The proposed unit is also located in the Tier 1 zone of the U.S. Virgin Islands Coastal Zone Management Program. All construction in the Tier 1 zone requires permits from both the U.S. Virgin Islands Legislature and the U.S. Army Corps of Engineers (USACE), which include an environmental review.<sup>12</sup> Thus, development activity may

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<sup>6</sup> Personal communication on November 2, 2006 with Maritza Vargas, a Service biologist in the Puerto Rico field office, confirms the Service intended to fully exclude the Marbella North property. As currently drawn, the proposed unit slightly overlaps the Marbella property. The overlap, which is less than 2.5 acres, appears to have resulted from a mapping error. Using the per acre market values of land described later in this report, the 2.5 acres are estimated to be worth between \$31,500 and \$105,000. *C. melanocarpa* does not exist within the 2.5 acre overlap, and the final designation will likely be corrected to exclude these acres.

<sup>7</sup> Deed history and plot map for the property provided by Service biologist in Puerto Rico field office. Received September 27, 2006.

<sup>8</sup> Personal communication with Jay Isherwood, President of Virgin Islands Title & Trust Company and part owner of property in proposed unit, on September 12, 2006.

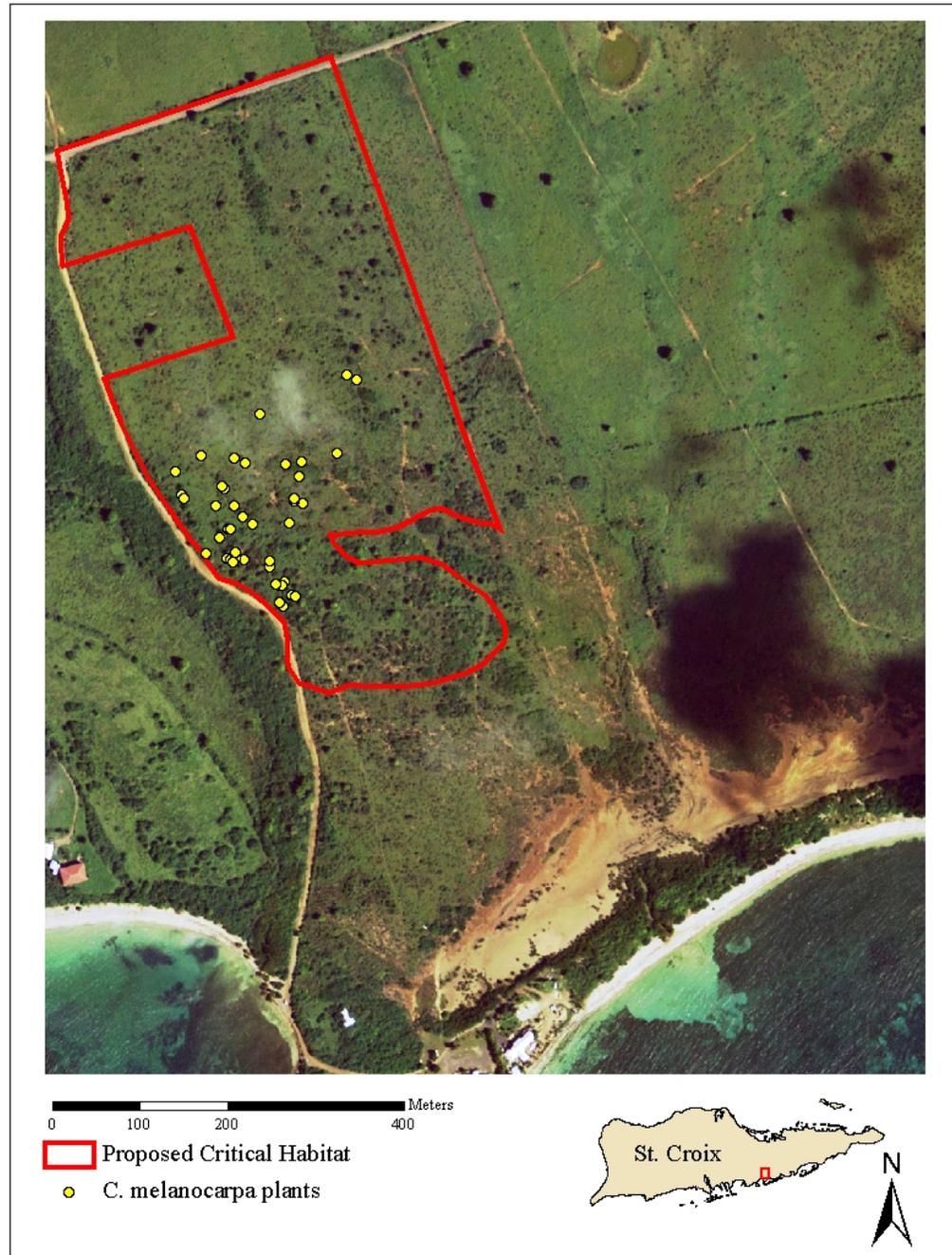
<sup>9</sup> Public comment of J.H. Isherwood, Isherwood and Isherwood, P.C. "RE: Second Presentation of public comments related to proposed rulemaking with respect to *Catesbaea melanocarpa*." Dated April 13, 2007.

<sup>10</sup> Ibid.

<sup>11</sup> Website of The Virgin Islands Comprehensive Land and Water Use Plan. U.S. Virgin Islands Department of Planning and Natural Resources. Accessed at <http://www.viczmp.com/Programs/clwup/index.html> on October 9, 2006.

<sup>12</sup> Website of The Virgin Islands Coastal Zone Management Program. U.S. Virgin Islands Department of Planning and Natural Resources. Accessed at <http://www.viczmp.com/> on October 9, 2006.

EXHIBIT 1. AERIAL PHOTOGRAPH OF PROPOSED CRITICAL HABITAT



Source: In October 2002, the Service mapped the distribution of *C. melanocarpa* using GPS technology. Received from Maritza Vargas, Puerto Rico field office biologist, on September 11, 2006.

already be restricted to some degree through these channels. As discussed in Appendix A, 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 proposed CHD, 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)). This analysis therefore 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 of the proposed critical habitat designation, even where some of those threats may be mitigated by overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation.

#### MARKET VALUE OF PARCEL

7. Transactions of parcels with characteristics similar to that of the designated parcel on the southern shore of St. Croix are infrequent. However, it is possible to establish a range of possible market values for the proposed unit considering 1) the parcel's assessed value and 2) the sale prices of nearby, comparable parcels. The assessed value of the 75-acre property owned by the Virgin Islands Title and Trust is \$873,371, or \$11,600 per acre.<sup>13</sup> The Tax Assessor's Office, however, could not confirm the date of this assessment.<sup>14</sup> At the assessed value per acre, the parcel in proposed critical habitat would be worth \$580,000 (50 acres x \$11,600 per acre). Although the Virgin Islands attempts to reassess property values every two years, real estate professionals on St. Croix indicate that most assessed values are several years out-of-date.<sup>15</sup> Therefore, assessed values are lower than the prices at which properties would sell on the market.<sup>16</sup>
8. Recent sales of similar properties near the proposed unit can be used to establish a more reliable range of current market values. In December 2005, 468 acres of the Longford Estate, which borders the eastern edge of proposed critical habitat, sold for \$5,897,000, or \$12,600 per acre.<sup>17</sup> Like the land in proposed critical habitat, the Longford property is a relatively treeless, flat tract of land that was heavily grazed in the past. Both properties are located along the southern beaches of Halfpenny Bay, five kilometers west of St. Croix's container port and the HOVENSA crude oil refinery, which is among the largest

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<sup>13</sup> Property Tax Database. Government of U.S. Virgin Islands. Accessed at <http://dev.public.vi-usvi.cavucorp.com/main.asp> on October 12, 2006.

<sup>14</sup> Personal communication with Virgin Islands Office of the Tax Assessor and Cadastral on October 12, 2006.

<sup>15</sup> Website of U.S. Virgin Islands Lieutenant Governor, Office of the Tax Assessor and Cadastral. Accessed at [http://www.ltg.gov.vi/departments/tax\\_assessor/tax.html](http://www.ltg.gov.vi/departments/tax_assessor/tax.html) on October 10, 2006.

<sup>16</sup> Personal communication with Jay Isherwood, real estate attorney and President of Virgin Islands Title & Trust Company, on September 12, 2006 and Julie San Martin, Re-Max Realtor and part owner of property in proposed unit, on October 5, 2006.

<sup>17</sup> MLS sales listings for St. Croix provided by Julie San Martin, Re-Max Realtor, on October 5, 2006.

refineries in the world.<sup>18</sup> These beaches are generally considered less desirable than St. Croix's northern beaches, because tanker traffic can disrupt the ocean views.

9. Despite these similarities, the Longford property is not perfect for comparison with proposed critical habitat for two reasons. First, the Longford property is zoned for agriculture, while proposed critical habitat is zoned for low density residential.<sup>19</sup> Second, given the larger size of the Longford property (468 acres), it was likely sold at a discounted price per acre.<sup>20</sup> Thus, the \$12,600 per acre of the Longford property can be considered a lower bound estimate for the market value of the proposed unit. At this lower bound price per acre, the parcel in proposed critical habitat is worth \$630,000 (50 acres x \$12,600 per acre). As the Longford sale in December 2005 is likely more recent than the assessed value, it is used as the lower bound estimate.
10. Aside from the Longford property, no recent vacant land sales have occurred near proposed critical habitat.<sup>21</sup> Due to this lack of comparable parcels in the immediate area, vacant parcels throughout the island were also considered. The prices listed for these parcels vary from tens of thousands of dollars to hundreds of thousands of dollars per acre, given the wide range in their attributes. For example, some parcels are located near particularly attractive communities and/or natural features. Others are offered as lots in future large-scale developments or gated communities advertising a variety of amenities. The parcels also vary in the quantity and quality of their basic infrastructure, such as access to sewer, water, electricity, and roads.<sup>22</sup> Due to the wide variation in parcel attributes and prices, it is not possible to identify an ideal set of sales for comparison with the proposed unit.
11. Upon the recommendation of a realtor (who is also a part owner of the proposed unit), a recent sale of a 26-acre parcel along Cane Bay on St. Croix's northern coast is used to define an upper bound price per acre. A second realtor without a financial interest in the proposed unit confirmed that this upper bound price per acre was reasonable.<sup>23</sup> The Cane Bay parcel sold in June 2006 for \$1.1 million, or \$42,000 per acre.<sup>24</sup> It is zoned for District 3: Medium Intensity, which allows denser residential development than the

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<sup>18</sup> HOVENSA website accessed at <http://www.hovensa.com/hr/about.htm> on October 6, 2006.

<sup>19</sup> Website of The Virgin Islands Comprehensive Land and Water Use Plan. U.S. Virgin Islands Department of Planning and Natural Resources. Accessed at <http://www.viczmp.com/Programs/clwup/index.html> on October 9, 2006.

<sup>20</sup> Personal communication with Julie San Martin, Re-Max Realtor and part owner of property in proposed unit, on October 5, 2006.

<sup>21</sup> Personal communication with Julie San Martin, Re-Max Realtor and part owner of property in proposed unit, on October 5, 2006.

<sup>22</sup> MLS property listings for St. Croix accessed at Re-Max St. Croix website at <http://www.st-croix-real-estate.com/> on October 10, 2006.

<sup>23</sup> Personal communication with Amy Land-de Wilde, Coldwell Banker: Land-de Wilde Realty, on December 5, 2006.

<sup>24</sup> MLS sales listings for St. Croix provided by Julie San Martin, Re-Max Realtor, on October 5, 2006.

District 2 zoning in proposed critical habitat.<sup>25</sup> In addition, the Cane Bay beaches on the north coast are more highly prized than the beaches near proposed critical habitat. Thus, the \$42,000 per acre at Cane Bay represents an upper bound estimate for the proposed unit. At this upper bound price per acre, the parcel's market value is \$2.1 million (50 acres x \$42,000 per acre). Exhibit 2 summarizes the range of market values for the land in proposed critical habitat. For various reasons noted above the lower bound estimate likely understates the market value, while the upper bound estimate likely overstates the market value.

**EXHIBIT 2. MARKET VALUE OF LAND IN PROPOSED CRITICAL HABITAT**

	LOWER BOUND	UPPER BOUND
Market value per acre	\$12,600	\$42,000
Total acres	50	50
Market value	\$630,000	\$2,100,000

12. In May 2001, the Virgin Islands Title and Trust Company commissioned an appraisal of the property. The appraisal cites seven sales between July 1999 and December 2000 as comparable land sales. Three of the sales were discarded because they were considered too dissimilar from the property. The average sale price per acre of the remaining four properties was \$8,151. These sales are now six to seven years old, and according to the appraisal document occurred "during the poor St. Croix economy and slow real estate market."<sup>26</sup> Properties have appreciated significantly since then and may have even doubled, placing the average sale price per acre within the range of estimates presented in Exhibit 2.

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<sup>25</sup> Website of The Virgin Islands Comprehensive Land and Water Use Plan. U.S. Virgin Islands Department of Planning and Natural Resources. Accessed at <http://www.viczmp.com/Programs/clwup/index.html> on October 9, 2006.

<sup>26</sup> Appraisal of Remainder Parcel #1 Estate Granard, St. Croix, USVI. Caribbean Engineering Associates, Inc. August 1, 2001. Received from Jay Isherwood, President of Virgin Islands Title & Trust Company and part owner of property in proposed unit, on October 13, 2006.

**LIMITATIONS ON DEVELOPMENT IN CRITICAL HABITAT**

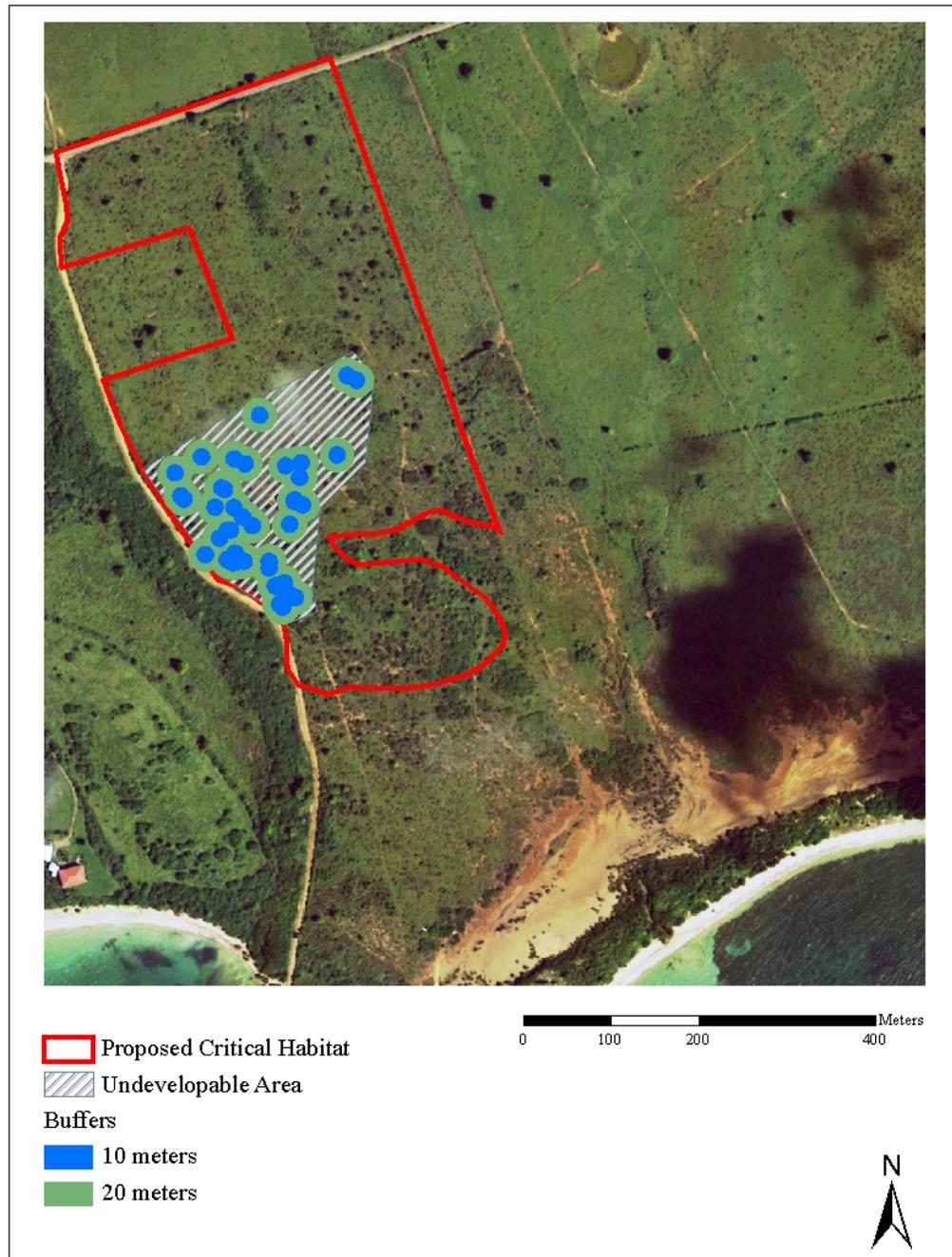
13. The landowner of the proposed critical habitat area states that "no development is presently planned for the Property which would threaten or impact the existing population of this Species."<sup>27</sup> However, the Service biologists who will oversee the *C. melanocarpa* critical habitat designation state that, should development be planned on this property in the future, they will recommend that development occurring in critical habitat maintain a buffer of ten to twenty meters around each plant.<sup>28</sup> Exhibit 3 shows how much land that ten or twenty-meter buffers would occupy, should the landowner choose to implement no-development buffers on his land, based on the 2002 distribution of *C. melanocarpa* mapped by the Service. As a result of the buffers, there would be little space to build residential units within the large cluster of plants on the western edge of the proposed unit. Linking together the twenty meter buffers shown in green in Exhibit 3 creates a conservative estimate of the area which would likely be undevelopable if the buffers were adopted. Under this scenario, 10.5 acres would be left undeveloped to protect the plant; the remaining 39.5 acres outside of the buffer zone would remain available for development.

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<sup>27</sup> Public comment of J.H. Isherwood, Isherwood and Isherwood, P.C. "RE: Second Presentation of public comments related to proposed rulemaking with respect to *Catesbaea melanocarpa*." Dated April 13, 2007.

<sup>28</sup> Personal communication with Service biologist in Puerto Rico field office, on September 6, 2006. It should be noted that the Act does not specifically prohibit "take" of endangered plants unless the plants are under Federal jurisdiction or the action is otherwise in violation of State law. Therefore, on private lands, unless a Federal nexus is present (e.g., a landowner requires a permit from a Federal agency to undertake an activity and therefore that agency is subject to consultation with the Service under section 7 of the Act), private landowners are not obligated by the Service to take actions to manage or minimize their impact on plants located on their property. In this case, it is possible that a Federal nexus may exist for future development activities. This economic analysis therefore estimates the costs of potential conservation efforts that could be undertaken by the landowner. However, the probability that these conservation actions will be taken is unknown.

EXHIBIT 3. UNDEVELOPABLE LAND IN PROPOSED CRITICAL HABITAT



Source: IEc analysis

14. If a portion of the property becomes undevelopable, much of the value of that portion would be lost. That is, without the opportunity to generate profit from the land through development, the owner is only able to sell the land at a significantly reduced price. The land certainly retains some residual value for non-development uses or for a development footprint that does not intersect the preserved area. For example, higher density construction might be allowed on the remainder of the parcel. However, assuming the

landowners lose the full market value of the undevelopable land, the 10.5 acre buffer zone in proposed critical habitat results in a loss of \$132,300 to \$441,000 to the landowners (10.5 acres x the price per acre), using the per acre values reported above. Exhibit 4 summarizes the upper and lower bound losses to landowners due to proposed critical habitat. On both ends of the range the losses represent 21 percent of the property's estimated value, because the 10.5 acres of undevelopable land constitute 21 percent of the total area of the property.

**EXHIBIT 4. ECONOMIC LOSSES TO LANDOWNERS**

	LOWER BOUND	UPPER BOUND
Price per acre	\$12,600	\$42,000
Undevelopable acres	10.5	10.5
Total value of loss	\$132,300	\$441,000
% of Total Property Value	21%	21%

15. These values reflect the present value reduction in the option value of the designated property.<sup>29</sup> Whether actual economic losses will be closer to the lower or upper bound depends on the land's per acre market value, which ultimately depends on demand for the property. The Virgin Islands Title and Trust Company and Marbella North, Inc. both abandoned plans to develop the site, suggesting that current demand for residential and tourist development in the area is not particularly strong.<sup>30</sup> Similarly, a large tract along Canegarden Bay, which extends from the HOVENSA refinery to Halfpenny Bay, has been repeatedly considered for development over the last twenty years. However, these plans also remain unrealized.<sup>31</sup> The proximity to the refinery on the west and the Longford grazing lands on the east has likely directed investment in hotels and condos to more choice sites readily available on St. Croix's northern coast.

**INTRODUCTION OF NEW PLANTS**

16. The Recovery Plan for *C. melanocarpa* states that the Service will make efforts to expand the population on St. Croix from 100 to 250 individuals.<sup>32</sup> The Service's Puerto Rico

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<sup>29</sup> The losses to landowners do not need to be discounted, because they are already in present value terms. The decline in the property's value is assumed to occur immediately upon designation of critical habitat, when the property's full development potential becomes encumbered.

<sup>30</sup> Marbella North, Inc., a residential developer based in Maryland, owns the square lot excluded from the proposed unit.

<sup>31</sup> Personal communication with Julie San Martin, Re-Max Realtor and part owner of property in proposed unit, on October 5, 2006.

<sup>32</sup> Recovery Plan for *Catesbaea melanocarpa*. U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. Approved July 15, 2005. Accessed on September 6, 2006 at [http://ecos.fws.gov/species\\_profile/servlet/gov.doi.species\\_profile.servlets.SpeciesProfile?spcode=Q30M](http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=Q30M) and Personal communication with Service biologist in Puerto Rico field office, on September 6, 2006.

field office prefers to plant new individuals in established protected areas, such as the Sandy Point National Wildlife Refuge, rather than in the proposed unit. With competing development uses in the proposed unit, the survival of introduced individuals would be uncertain.<sup>33</sup> Consequently, expansion of the existing population is not expected to cause economic impacts.

#### GRAZING

17. The land in proposed critical habitat has historically been subject to periodic grazing and holds an agricultural lease that has not been terminated.<sup>34</sup> However, the land has not been grazed for several years.<sup>35</sup> A fence surrounding the parcel prevents cattle from adjacent properties from destroying the plants. If the land were to be actively grazed, the Service would recommend that the owners participate in volunteer programs with the Natural Resource Conservation Service, an entity within the U.S. Department of Agriculture.<sup>36</sup> These programs provide Federal grants for ranchers who engage in ranching practices that protect endangered species.<sup>37</sup> No additional economic impacts are expected related to this activity.

#### FIRES

18. The current landowners do not deliberately start fires in proposed critical habitat. The landowner notes that past periodic grazing activity reduced the fire hazard to this area.<sup>38</sup> Nevertheless, without livestock grazing the land in recent years, the tall grasses are susceptible to accidental fires. An accidental burn on part of the parcel last occurred in 1997, although *C. melanocarpa* was unaffected.<sup>39</sup> These fires mainly result from human

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<sup>33</sup> Recovery Plan for *Catesbaea melanocarpa*. U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. Approved July 15, 2005. Accessed on September 6, 2006 at [http://ecos.fws.gov/species\\_profile/servlet/gov.doi.species\\_profile.servlets.SpeciesProfile?spcode=Q30M](http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=Q30M) and Personal communication with Service biologist in Puerto Rico field office, on September 6, 2006.

<sup>34</sup> Public comment of J.H. Isherwood, Isherwood and Isherwood, P.C. "RE: Second Presentation of public comments related to proposed rulemaking with respect to *Catesbaea melanocarpa*." Dated April 13, 2007.

<sup>35</sup> Personal communication with Julie San Martin, Re-Max Realtor and part owner of property in proposed unit, on October 5, 2006.

<sup>36</sup> Personal communication with Service biologist in Puerto Rico field office, on September 6, 2006. Note that, as stated above, the Act does not specifically prohibit "take" of endangered plants unless the plants are under Federal jurisdiction or the action is otherwise in violation of State law. Therefore, on private lands, unless a Federal nexus is present (e.g., a landowner requires a permit from a Federal agency to undertake an activity and therefore that agency is subject to consultation with the Service under section 7 of the Act), private landowners are not obligated by the Service to take actions to manage or minimize their impact on plants located on their property. On this property, grazing activities appear unlikely to involve a Federal nexus. Thus, the probability that these conservation actions will be taken is unknown.

<sup>37</sup> Website of Natural Resource Conservation Service, USDA. Accessed at <http://www.nrcs.usda.gov/Programs/cpgl/> on October 10, 2006.

<sup>38</sup> Public comment of J.H. Isherwood, Isherwood and Isherwood, P.C. "RE: Second Presentation of public comments related to proposed rulemaking with respect to *Catesbaea melanocarpa*." Dated April 13, 2007.

<sup>39</sup> Final Rule for *C. melanocarpa*. 50 CFR Part 17. RIN 1018-AU76. Department of the Interior. Fish and Wildlife Service. Federal Register. 71: No. 162. Tuesday, August 22, 2006.

negligence, such as throwing cigarettes out car windows; therefore, the Service does not expect the landowners to mitigate this threat.<sup>40</sup>

#### SMALL BUSINESS AND ENERGY IMPACT ANALYSIS

19. The property proposed for designation is managed by the Virgin Islands Title and Trust Company on behalf of several individual landowners. As shown in Exhibit 4, this analysis estimates that these landowners could lose 21 percent of the value of their property. However, no North American Industry Classification System (NAICS) code exists for landowners, and SBA does not provide a definition of a "small" landowner. Thus, private landowners are generally not considered to be small entities under the Regulatory Flexibility Act, as amended by the Small Business Enforcement Fairness Act. Furthermore, this analysis does not anticipate a decrease in the amount of construction activity on St. Croix as a result of the Proposed Rule. As a result, small developers and construction firms are not anticipated to be affected. Finally, the proposed designation is not expected to impact energy production. A description of the conditions under which comprehensive analyses of small business and energy impacts are required can be found in Appendix B.

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<sup>40</sup> Personal communication with Service biologist in Puerto Rico field office, on October 10, 2006.

## APPENDIX A | FRAMEWORK FOR ANALYSIS

**A.1 PURPOSE OF THE ECONOMIC ANALYSIS**

20. The purpose of this report is to estimate the economic impact of actions taken to protect *Catesbaea melanocarpa* as a result of the designation of critical habitat. The report takes into account the cost of conservation-related measures associated with future economic activities that may adversely affect the proposed designation. The analysis attempts to predict future costs likely to occur after the CH designation is finalized.
21. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.<sup>41</sup> 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).<sup>42</sup> 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.<sup>43</sup>

**A.2 REGULATORY ALTERNATIVES**

22. Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives. Alternatives to the proposed rule are possible through section 4(b)(2) of the Act. Section 4(b)(2) allows the Service to exclude areas proposed for designation based on economic impact and other relevant impact. Consideration of impacts at the unit level may result in alternate boundaries for the proposed critical habitat.

**A.3 APPROACH TO ESTIMATING ECONOMIC EFFECTS**

23. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect *Catesbaea melanocarpa* and its habitat. 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

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<sup>41</sup> 16 U.S.C. §1533(b)(2).

<sup>42</sup> 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.

<sup>43</sup> 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 proposed CH 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 (10<sup>th</sup> Cir. 2001)).

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 *Catesbaea melanocarpa* conservation efforts.

24. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of *Catesbaea melanocarpa* conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a relatively small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

#### A.3.1 EFFICIENCY EFFECTS

25. 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 *Catesbaea melanocarpa* 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.<sup>44</sup>
26. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal landowner or manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been species' habitat. 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.
27. 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

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<sup>44</sup> 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 (2<sup>nd</sup> 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>.

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.

28. This analysis begins by measuring costs associated with measures taken to protect *Catesbaea melanocarpa* 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 efforts is expected to significantly impact markets, the analysis will consider potential changes in consumer and/or producer surplus in affected markets.

#### A.3.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

29. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.<sup>45</sup> This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

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

30. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future *Catesbaea melanocarpa* conservation efforts.<sup>46</sup> In addition, in response to Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.<sup>47</sup>

##### A.3.2.1 Regional Economic Effects

31. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by 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

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<sup>45</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

<sup>46</sup> 5 U.S.C. § 601 *et seq.*

<sup>47</sup> Executive Order 13211, *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*, May 18, 2001.

recreationists). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

32. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or 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.
33. 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.

#### A.4 SCOPE OF THE ANALYSIS

34. 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 of the proposed critical habitat designation. 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 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.<sup>48,49</sup>
35. Coextensive 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

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<sup>48</sup> 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 proposed CHD, 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)).

<sup>49</sup> 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.

contribute to the efficacy of the critical habitat designation efforts, the impacts of these actions are considered relevant for understanding the full effect of the proposed critical habitat designation. Enforcement actions taken in response to violations of the Act, however, are not included.

#### A.4.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

36. This analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as the 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."<sup>50</sup> 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."<sup>51</sup> In addition, under section 4, the Service is required to develop a recovery plan that recommends actions necessary to satisfy the biological needs and assure the recovery of the species. The plan serves as guidance for interested parties, including Federal, State, and local agencies, private landowners, and the general public.
37. The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:
- 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. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and CH designation.<sup>52</sup>
  - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."<sup>53</sup> The economic impacts associated with this section manifest themselves in sections 7 and 10.

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<sup>50</sup> 16 U.S.C. 1533.

<sup>51</sup> 16 U.S.C. 1533.

<sup>52</sup> 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.

<sup>53</sup> 16 U.S.C. 1532.

- Under section 10(a)(1)(B) of the Act, an entity (i.e., a landowner or local government) may develop a Habitat Conservation Plan (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.<sup>54</sup> The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs.

#### A.4.2 OTHER RELEVANT PROTECTION EFFORTS

38. 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. For 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.

#### A.4.3 ADDITIONAL ANALYTIC CONSIDERATIONS

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

##### A.4.3.1 Time Delay and Regulatory Uncertainty Impacts

40. Time delays are costs due to 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 their responsibilities with regard to critical habitat designation).

##### A.4.3.2 Stigma Impacts

41. 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.

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<sup>54</sup> U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at <http://endangered.fws.gov/hcp/>.

#### A.4.4 BENEFITS

42. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.<sup>55</sup> OMB's Circular A-4 distinguishes two types of economic benefits: direct *benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.<sup>56</sup>
43. In the context of critical habitat 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.<sup>57</sup> *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.*
44. 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. 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.
45. 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 in this report. For example, if improved species habitat leads to an increase in recreational opportunities, the local economy may experience an associated measurable, positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

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<sup>55</sup> Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

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

<sup>57</sup> U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

#### A.4.5 GEOGRAPHIC SCOPE OF THE ANALYSIS

46. The geographic scope of the analysis includes areas proposed for critical habitat designation. The analysis focuses on activities within or affecting these areas. Impacts are presented at the finest level of resolution feasible, given available data. For this proposed critical habitat designation, impacts are reported for the one unit on St. Croix identified in the proposed rule.

#### A.5 ANALYTIC TIME FRAME

47. 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 will forecast projected future impacts for the 20 year period from 2007 (the year of the species' final CH designation) to 2026. Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

#### A.6 INFORMATION SOURCES

48. The analysis relies on data collected during communication with the following entities:
- U.S. Fish and Wildlife Service (Service);
  - Office of the Tax Assessor & Cadastral, U.S. Virgin Islands;
  - Owner of the property containing proposed critical habitat; and
  - Realtors on St. Croix.

**APPENDIX B | SMALL ENTITY AND ENERGY IMPACTS ANALYSIS**

49. This appendix considers the extent to which the analytic results presented in the report reflect potential future impacts to small entities and the energy industry. This appendix is included pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) in 1996. The energy analysis in Section B.2 is conducted pursuant to Executive Order No. 13211.

**B.1 SBREFA ANALYSIS**

50. In accordance with SBREFA, when a Federal agency publishes a notice of rulemaking for any proposed or final rule, it must make available for public comments a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). No regulatory flexibility analysis is required, however, if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities.

**DEFINITION OF A SMALL ENTITY**

51. 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.

#### DESCRIPTION OF SMALL ENTITIES TO WHICH THE PROPOSED RULE WILL APPLY

52. 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 impacted within the definition of the RFA.<sup>58</sup>
53. 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 particulate matter.<sup>59</sup> 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 impacted within the definition of the RFA.
54. The Small Business Administration (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

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<sup>58</sup> 773 F. 2d 327 (D.C. Cir. 1985).

<sup>59</sup> 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

when the impacts of its regulation are indirect.<sup>60</sup> "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."<sup>61</sup>

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

#### CONCLUSION

56. The property proposed for designation is managed by the Virgin Islands Title and Trust Company on behalf of several individual landowners. As shown in Exhibit 4 of the report, this analysis estimates that these landowners could lose 21 percent of the value of their property. Generally, however, private landowners are not considered to be small entities under the RFA. Furthermore, this analysis does not anticipate a decrease in the amount of construction activity on St. Croix as a result of the proposed rule. As a result, small developers and construction firms are not anticipated to be affected.

#### B.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

57. 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."<sup>62</sup>
58. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute "a significant adverse effect" when compared with the regulatory action under consideration:

<sup>60</sup> Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 20.

<sup>61</sup> *Ibid.*, pg. 21.

<sup>62</sup> Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.<sup>63</sup>

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<sup>63</sup> Ibid.