

**ADDENDUM TO THE DRAFT ECONOMIC  
ANALYSIS OF PROPOSED CRITICAL HABITAT  
FOR THE PURPLE AMOLE AND CAMATTA CANYON AMOLE**

FINAL DRAFT

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## INTRODUCTION

On November 8, 2001 the U.S. Fish and Wildlife Service (the Service) proposed designation of critical habitat under the Endangered Species Act of 1973, as amended (the Act), for two varieties of a lily species: the purple amole (*Chlorogalum purpureum* var. *purpureum*) and the Camatta Canyon amole (*Chlorogalum purpureum* var. *reductum*). The proposed critical habitat designation occurs on approximately 21,980 acres of land in Monterey and San Luis Obispo counties, California. Because the Act also calls for an economic analysis of the critical habitat designation, the Service released a *Final Draft Economic Analysis of Critical Habitat Designation for the Purple Amole and Camatta Canyon Amole* (hereafter *DEA*) for public review and comment on May 7, 2002.<sup>1</sup>

This addendum to the *DEA* addresses issues raised during the public comment period for that analysis and incorporates additional information received through personal communications with Action agencies in regard to public comments.

## REVISIONS TO THE DRAFT ECONOMIC ANALYSIS

The following section describes the implications of, and responses to, the public comment to the *DEA*, as well as additional research on the analysis presented in the *DEA*. Section numbers presented in the headers of this Addendum refer to the section numbers of the *DEA*.

### SECTION 2.5      Economic Impacts

This section presents an expanded discussion of the types and (where data are available) likely magnitude of impacts associated with both the listing of the purple amole and Camatta Canyon amole and subsequent designation of critical habitat for the species. The time period over which impacts are estimated is 10 years.

#### 2.5.1    **Unit 1, Fort Hunter Liggett**

##### Fort Hunter Liggett Lands

Fort Hunter Liggett, a U.S. Army Reserve installation, supports various military training activities, including field maneuvers (e.g., bivouacking, weapons testing, constructing defense

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<sup>1</sup> Copies of the *Final Draft Economic Analysis of Critical Habitat Designation for the Purple Amole and Camatta Canyon Amole* are available by writing to the Field Supervisor, Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service, 2493 Portola Road, Suite B, Ventura, CA 93003.

positions, mobilization of large vehicles and equipment, parachute exercises, etc.), fixed-range firing, live fire exercises, aviation training, and testing activities. These activities often require land disturbances such as grading, digging, scraping, and other methods that may have adverse effects on the purple amole and its habitat.

At the writing of the *DEA*, Fort Hunter Liggett was preparing a biological assessment for reinitiation of a programmatic consultation (1-8-96-F-40) with the Service. This programmatic biological assessment addresses regularly occurring activities that affect threatened or endangered species, including the purple amole. In addition, as part of the programmatic consultation, Fort Hunter Liggett requested a conference opinion in anticipation of the designation of critical habitat for the purple amole. Therefore, reinitiation of the consultation upon final designation of the critical habitat is unlikely.

To comply with Federal statutory requirements, biologists at Fort Hunter Liggett are currently developing a draft Integrated Natural Resources Management Plan (INRMP) for the installation. This plan intends to reduce the likelihood of harmful activities taking place in areas critical to the purple amole, supporting the long-term conservation of the species. Fort Hunter Liggett provided an initial draft INRMP to the Service in January, 2002. The Service replied with preliminary comments in draft form on March 6, 2002, followed by an almost identical final comment letter on June 4, 2002. These comment letters provide recommendations for modifications to the INRMP that the Service believes are necessary to ensure that the Army Reserve's management actions for the purple amole are beneficial to the taxon and its habitat.<sup>2</sup>

The Service also sent a letter to the Army Reserve, dated May 31, 2002, describing the measures it believes are necessary for the long-term conservation of the purple amole.<sup>3</sup> The May 31, 2002 letter is not a comment letter on the draft INRMP, and it does not specifically address critical habitat issues. However, it provides detailed information about the types of modifications the Service recommends to achieve long-term conservation of the plant.

### **Administrative Costs**

The Service expects that the majority of future activities at Fort Hunter Liggett will be covered by the programmatic consultation, which is expected to be completed during the fall of 2002. Therefore, the Army Reserve is unlikely to consult frequently with the Service to address individual activities. The administrative costs of the programmatic consultation are unchanged from

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<sup>2</sup> Personal communication with Biologist, U.S. Fish and Wildlife Service, Ventura Field Office, July 31, 2002.

<sup>3</sup> Letter from the U.S. Fish and Wildlife Service to Lieutenant Colonel Philip E. Tullar, Commanding, Department of the Army, Headquarters, Fort Hunter Liggett, Subject: "U.S. Fish and Wildlife Service Concerns and Request Relating to Purple Amole Conservation and Long-term Management at Camp Roberts and Fort Hunter Liggett," May 31, 2002.

the *DEA*, with costs of approximately \$30,000 for the Army Reserve and \$6,000 for the Service. In addition, the programmatic consultation may need to be revised through formal consultation in the future (i.e., approximately five to seven years after completion). Administrative costs for a future revision are estimated to be \$8,000 for the Army Reserve and \$3,000 for the Service, as described in the *DEA*.

Because the programmatic consultation is not expected to be completed until the fall of 2002, the Service anticipates conducting up to two formal consultations with the Army Reserve for activities taking place during the summer and/or fall of 2002. In addition, the Service expects the Army Reserve to propose some activities that lie outside the scope of the programmatic consultation. Therefore, the Service anticipates that up to a total of six additional formal consultations may occur over the next ten years. As described in the *DEA*, the administrative cost for each of these consultations is estimated to be \$8,000 for the Army Reserve and \$3,000 for the Service, with total costs of approximately \$48,000 for the Army Reserve and \$18,000 for the Service.

The Service also anticipates that the Army Reserve will engage in a number of informal consultations for activities taking place at Fort Hunter Liggett. The Service estimates a total of approximately 20 informal consultations to occur over the next ten years. An informal consultation, as described in the *DEA*, would result in costs of approximately \$1,000 to the Army Reserve and \$1,000 to the Service, with total costs of approximately \$20,000 to the Army Reserve and \$20,000 to the Service.

### **Project Modification Costs**

The *DEA* made predictions about project modifications that would likely be recommended during future section 7 consultations based on the Service's consultation history with Fort Hunter Liggett. The costs of these project modifications are described and quantified in section 2.5.1 of the *DEA*.

Since the publication of the *DEA*, several new sources of information describing potential project modifications have become available. As described earlier, the Service has met with the Army Reserve to discuss and provide comments on Fort Hunter Liggett's draft INRMP. Statutory requirements for preparation of an INRMP are separate from section 7 consultation requirements, and therefore costs associated with developing and implementing the INRMP should not be included in an analysis of the impacts of the designation of critical habitat. However, prior to the implementation of an INRMP that meets the approval of both the Service and the Army Reserve, the Service has indicated that the types of conservation measures recommended in discussions about the draft INRMP, as well as in its May 31, 2002 letter, should be considered by the Army Reserve for the long-term management and conservation of the purple amole. Therefore, these conservation measures provide insight into the recommendations likely to be made by the Service during future

section 7 consultations that take place prior to the implementation of an approved INRMP.<sup>4</sup> In addition, the Army Reserve submitted comments on the *DEA* in a letter dated June 5, 2002. The letter stated that the *DEA* "is based on considerations and factors that the Service is no longer considering...The new restrictions proposed by the Service are qualitatively different than those found in the Draft Economic Analysis or the Proposed Critical Habitat Designation of November 2001."<sup>5</sup>

In response to this new information received from the Service and Fort Hunter Liggett, this addendum revises the list of potential project modifications associated with future section 7 consultations. First, in Exhibit 1, we describe these new project modifications qualitatively. Then, we quantify the costs associated with some of these activities based on information provided by Fort Hunter Liggett and the Service.

Exhibit 1 compares the project modifications quantified in the *DEA* with the protective measures recommended by the Service in their May 31, 2002 letter describing recommendations for the conservation and long-term management of the purple amole. The first column lists the consultations predicted to occur over the next ten years. The project modifications considered in the *DEA* are listed in the second column, next to the relevant consultations. The last column shows the list of protective measures recommended by the Service on May 31, 2002. A comparison of the second and third columns shows the similarities and differences in the types of modifications considered in the *DEA* and the modifications considered in this addendum. Some or all of the measures in the third column may be recommended as project modifications in the future consultations, depending on the scope of proposed projects, timing of the consultations, and timing of the completion of the INRMP. In the third column, we do not attempt to link specific project modifications to certain consultations, programmatic or otherwise. Rather, we assume that some or all of these project modifications are likely to be recommended during consultations expected to take place over the next ten years.

Our assumption that the protective measures recommended by the Service provide an indication of the potential project modifications likely to result from future consultations is likely to overstate, rather than understate, future costs. In the case that Fort Hunter Liggett addresses these measures as recommended in their final INRMP, a portion of the cost of these modifications are likely to be attributable to that effort, and not section 7.

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<sup>4</sup> Personal communication with Biologist, U.S. Fish and Wildlife Service, Ventura Field Office, June 16, 2002.

<sup>5</sup> Letter from Department of the Army, Headquarters, Fort Hunter Liggett to Ms. Diane Noda, Field Supervisor, United States Fish and Wildlife Service, Ventura Fish and Wildlife Office, Subject: "Draft Economic Analysis Of Critical Habitat Designation For The Purple Amole And The Camatta Canyon Amole," June 5, 2002.

<b>Exhibit 1</b>		
<b>REVISION OF PROPOSED PROJECT MODIFICATIONS</b>		
<b>Consultation</b>	<b>DEA Assumptions (based on past consultations)</b>	<b>Purple Amole Conservation and Long-Term Management Proposed by the Service on May 31, 2002</b>
Programatic	<ul style="list-style-type: none"> <li>• No use of tent stakes when bivouacking to preserve seeds and bulbs in upper soil surface;</li> <li>• Conducting little or no road grading except under emergency situations;</li> <li>• Keeping vehicles on existing roads where possible; and</li> <li>• Using kitchens or potable latrines to avoid digging.</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of 25% of the known, occupied habitat in each of three localities on Fort Hunter Liggett where purple amole is known to occur;</li> <li>• Of the approximately 75% of occupied habitat that is not fully protected in each of the three localities, one-third should be restricted to on-road vehicle travel and troop foot maneuvers only during the dry season;</li> <li>• The remaining two-thirds (50% of total occupied habitat) should have light or restricted use, to include no bivouacking activities, no off-road tracked vehicle use at any time, year-round on-road tracked and wheeled vehicle use, and off-road wheeled vehicle use only during the dry season, with the exception of certain areas that are critical to the military mission;</li> <li>• Buffer areas (unoccupied, suitable habitat for purple amole expansion and connectivity) are recommended and may be established. These areas should include limited military training activities (e.g., bivouacking during the dry season, etc.). Additional policies, programs, and projects may occur throughout the year or portions of the year as proposed in the Fort Hunter Liggett's March, 2002 programmatic biological assessment; and</li> <li>• Monitoring plots should be established so that each area occupied by purple amole (<i>i.e.</i>, no use, limited use, and no restriction) is included, allowing for a full range of life history data and a thorough analysis on effects of activities, or lack thereof.</li> </ul>
2 Formal	Same as above.	
4 Formal	Types of project modifications are difficult to predict.	
20 Informal	None.	None.
<p><u>Sources:</u></p> <ol style="list-style-type: none"> <li>1. U.S. Fish and Wildlife Service, <i>Final Draft Economic Analysis of Critical Habitat Designation for the Purple Amole and the Camatta Canyon Amole</i>, prepared by Industrial Economics, Incorporated, April 2002.</li> <li>2. Letter from the U.S. Fish and Wildlife Service to Lieutenant Colonel Philip E. Tullar, Commanding, Department of the Army, Headquarters, Fort Hunter Liggett, Subject: "U.S. Fish and Wildlife Service Concerns and Request Relating to Purple Amole Conservation and Long-term Management at Camp Roberts and Fort Hunter Liggett," May 31, 2002.</li> <li>3. Letter from Department of the Army, Headquarters, Fort Hunter Liggett to Ms. Diane Noda, Field Supervisor, United States Fish and Wildlife Service, Ventura Fish and Wildlife Office, Subject: "Draft Economic Analysis Of Critical Habitat Designation For The Purple Amole And The Camatta Canyon Amole," June 5, 2002.</li> <li>4. Personal communication with Biologist, U.S. Fish and Wildlife Service, Ventura Field Office, August 22, 2002.</li> </ol>		

Several conservation measures currently in place at Fort Hunter Liggett may overlap in part with those recommended by the Service. According to a representative of Fort Hunter Liggett, these measures include:

- Protection of 168 acres of occupied purple amole habitat (these acres represent 25% of occupied purple amole occurrences found within suitable habitat);
- Prohibition of hunting within the cantonment, Ammunition Supply Point (ASP) and a training area (referred to as Area 22);
- No grazing is allowed on the installation at this time;
- Prevention of operators to create new trails unless trails are not available; and
- Limitation of training activities within a certain training area (referred to as Training Area 25). Limitations include:
  - No off-road tracked vehicle use between November and June unless soils are dry;
  - No off-road wheeled vehicle travel or foot maneuvers between November and June unless soils are dry;
  - No bivouacking between November and June except in two designated areas;
  - Allowing only hand excavation year-round; and
  - Allowing no more than 200 soldiers to train at any one time for a total of 90 days between November and June.<sup>6</sup>

In addition to these measures, Fort Hunter Liggett implemented a monitoring program in 1998. Data was collected to describe vegetation associates, determine relative cover of vegetation associates based on cover classes, and better characterize life history characteristics of purple amole plants.<sup>7</sup>

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<sup>6</sup> Letter from the U.S. Fish and Wildlife Service to Lieutenant Colonel Philip E. Tullar, Commanding, Department of the Army, Headquarters, Fort Hunter Liggett, Subject: "U.S. Fish and Wildlife Service Concerns and Request Relating to Purple Amole Conservation and Long-term Management at Camp Roberts and Fort Hunter Liggett," May 31, 2002; and Letter from Department of the Army, Headquarters, Fort Hunter Liggett to Ms. Diane Noda, Field Supervisor, United States Fish and Wildlife Service, Ventura Fish and Wildlife Office, Subject: "Draft Economic Analysis Of Critical Habitat Designation For The Purple Amole And The Camatta Canyon Amole," June 5, 2002.

<sup>7</sup> Letter from the U.S. Fish and Wildlife Service to Lieutenant Colonel Philip E. Tullar, Commanding, Department of the Army, Headquarters, Fort Hunter Liggett, Subject: "U.S. Fish and Wildlife Service Concerns and Request Relating to Purple Amole Conservation and Long-term

Fort Hunter Liggett set aside some acreage of occupied purple amole habitat to compensate for loss of habitat in a former consultation (biological opinion 1-8-99-F-48R). However, the protected areas do not represent the distribution of purple amole on the installation. The lack of protection throughout the range of the species on the installation has resulted in the Service's concerns in relation to genetic vulnerability, connectivity between patches of known plants, pollinator activity, etc. The Service has asked Fort Hunter Liggett to preserve additional occupied purple amole occurrences for the long-term conservation of the purple amole and to implement activities limitations over larger areas of the installation. Some activities limitations recommended by the Service are already in place at the installation. As a result, the subset of the project modifications described in the third column that are likely to be associated with future section 7 consultations is uncertain.

This addendum quantifies some of the activities described in the third column of Exhibit 1 based on information provided by Fort Hunter Liggett and the Service. In its public comments on the *DEA*, the Army Reserve provided cost estimates for certain conservation measures it believes would be necessary to meet the Service's recommendations and the impacts of those measures, including;

- Additional monitoring requiring the employment of two GS-11 equivalent biologists, at a cost of \$2.1 million over ten years.
- Fencing of protected areas, at a total cost of \$250,000, plus additional maintenance costs over ten years that were not quantified.<sup>8</sup> This is the amount of fence that would be required to cordon off individual subsections of purple amole plants and therefore comes at a greater cost than restricting the entire area in one piece.
- Fort Hunter predicts that increased restrictions on training activities decrease the ability of the Army Reserve, National Guard, and other military units to train at Fort Hunter Liggett. Alternative training sites are extremely limited and would likely require travel to North Carolina. The Army Reserve expects that the travel costs would be significant.
- The cost of reduced military readiness is expected to be larger than the combined total of the other costs described in the preceding three bullets.

Conversations with the Service suggest that the costs associated with additional monitoring and protecting preserved areas may be less than estimated by Fort Hunter Liggett. The Service

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Management at Camp Roberts and Fort Hunter Liggett," May 31, 2002.

<sup>8</sup> The cost of installing the fence assumes that chain link will be used, at a cost of \$10 per linear foot (including gates). Approximately 25,000 linear feet of fence are assumed to be required.

requests that Fort Hunter Liggett make revisions to its monitoring protocol, have it peer reviewed, and have it approved by the Service. Assuming that the protocol is distributed to three peer reviewers, the cost of the review is likely to be \$15,000.<sup>9</sup> The Service believes the number of personnel at Fort Hunter Liggett designated for the current monitoring program (assuming those positions are staffed) should be sufficient to implement revisions to the monitoring protocol. Therefore, the only cost of revising the protocol should be that of peer review. As a result, the Service believes the total additional cost of revising the monitoring protocol is likely to be \$15,000 over ten years. However, to potentially overstate, rather than understate costs, this analysis assumes that the actual costs of implementing a revised monitoring protocol will not exceed Fort Hunter Liggett's estimate of \$2.1 million over the next ten years.

The Service does not necessarily recommend permanent fencing for purple amole areas. One possible alternative is the use of Siber Stakes to delineate areas. Installation of Siber Stakes along the same perimeter planned for fencing by Fort Hunter Liggett is estimated to cost \$15,100.<sup>10</sup> However, to potentially overstate, rather than understate costs, this analysis assumes that the cost of delineating the protected habitat area will not exceed the Army Reserve's estimate of \$250,000 over the next ten years.

This addendum does not quantify costs associated with other potential project modifications at Fort Hunter Liggett. It is important to note that the information provided by the economic analysis of critical habitat is just one of many inputs into the Service's evaluation of whether areas should be excluded under Section 4(b)(2). For example, national security interests may influence the designation of final critical habitat on Federal lands owned or managed by the Department of Defense. Consequently, the Service will consider the potential impacts on military readiness, even if these impacts are not quantified or monetized.

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<sup>9</sup> This estimate assumes three experts and \$5,000 per review based on our experience contracting for peer review of monitoring plans.

<sup>10</sup> The materials cost of Siber Stakes assumes one post every 20 meters, using six foot t-posts (approximately \$3 per t-post), 15 inch sections of 3 inch diameter PVC pipe (\$8.98 per ten feet), and 100 sheets of reflecting tape (\$14.05/sheet). The labor cost assumes two construction laborers (Standard Occupational Classification 47-2061) for one day of preparation plus one hour per post. (Materials used was obtained by the U.S. Fish and Wildlife Service from a representative of the California Army National Guard, Camp Roberts, transmitted via email to Industrial Economics, Incorporated on June 24, 2002. Materials costs obtained from personal communication with a local supplier, dated July 12, 2002. Labor cost estimates obtained from U.S. Department of Labor, Bureau of Labor Statistics, "2000 State Occupational Employment and Wage Estimates - California," accessed at [http://www.bls.gov/oes/2000/oes\\_ca.htm](http://www.bls.gov/oes/2000/oes_ca.htm) on July 12, 2002.)

## **Summary of Costs at Fort Hunter Liggett**

Because Fort Hunter Liggett supports known populations of the purple amole, and the programmatic consultation was slated to address this species prior to the critical habitat proposal, the programmatic consultation and associated protective measures would be addressed absent the designation of critical habitat for the purple amole. Therefore, costs stemming from the current programmatic consultation are likely to be co-extensive with the listing of the species. In addition, based on the Army Reserve's past history of including the purple amole in informal and formal consultations for activities taking place on the base, the costs associated with the formal consultations are also likely to be co-extensive with the listing of the species. As described in the *DEA*, the Service anticipates that approximately half of the potential informal consultations are likely to be attributable co-extensively to the listing of the species, and half are likely to be attributable solely to critical habitat.

As a result, total administrative costs associated with section 7 are likely to be \$106,000 for the Army Reserve and \$47,000 for the Service. Of that total, approximately \$20,000 is attributable solely to critical habitat. Costs of a revised monitoring protocol and fencing (or marking) protected habitat is not expected to exceed \$2.4 million. Other costs associated with potential changes in military training practices (such as additional travel costs to other training facilities) or the affects of section 7 on military readiness are not quantified. In summary, the total direct costs associated with quantified section 7 impacts are not likely to exceed \$2.5 million. Approximately \$20,000 of these costs are attributable solely to the designation of critical habitat.

### **2.6 Summary of Impacts**

Exhibit 2 revises the summary table provided in the *DEA* of activities that could lead to new consultations and project modifications along with expected costs incurred after critical habitat designation for the purple amole and the Camatta Canyon amole. Total estimated section 7 costs are not likely to exceed \$2.6 million, not including potential costs associated with changes in military training activities at Fort Hunter Liggett and a potential reduction in military readiness. Costs attributable solely to the designation of critical habitat are estimated to be \$96,000.

<b>Exhibit 2</b>				
<b>SUMMARY OF POTENTIAL SECTION 7 RELATED ECONOMIC IMPACTS WITHIN PROPOSED CRITICAL HABITAT FOR THE PURPLE AMOLE (ten year period)</b>				
<b>Critical Habitat Unit</b>	<b>Affected Party</b>	<b>Potentially Affected Activity</b>	<b>Estimated Section 7 Costs<sup>1</sup></b>	<b>Cost Due to Critical Habitat<sup>1</sup></b>
Unit 1, Fort Hunter Liggett	U.S. Army Reserve- Fort Hunter Liggett	Programmatic consultation and various military exercises	\$2.5 million <sup>2</sup>	\$10,000
	U.S. Fish and Wildlife Service	Programmatic consultation and consultations for various military exercises	\$47,000	\$10,000
	Private landowner	Technical assistance	\$12,000	\$12,000
	U.S. Fish and Wildlife Service	Technical assistance	\$12,000	\$12,000
<b>Unit 1 Total</b>			<b>\$2.5 million<sup>2</sup></b>	<b>\$44,000</b>
Unit 2, Camp Roberts	California Army National Guard- Camp Roberts	Various military exercises	\$50,000	\$5,000
	U.S. Fish and Wildlife Service	Consultations for various military exercises	\$25,000	\$5,000
	Private landowner	Technical assistance	\$2,000	\$2,000
	U.S. Fish and Wildlife Service	Technical assistance	\$2,000	\$2,000
<b>Unit 2 Total</b>			<b>\$79,000</b>	<b>\$14,000</b>
Unit 3, Camatta Canyon	U.S. Forest Service- Los Padres National Forest	Various activities	\$5,000	\$5,000
	U.S. Fish and Wildlife Service	Various informal consultations	\$5,000	\$5,000
	California Department of Transportation	None	None	None
	Private landowner	Technical Assistance	\$14,000	\$14,000
	U.S. Fish and Wildlife Service	Technical Assistance	\$14,000	\$14,000
<b>Unit 3 Total</b>			<b>\$38,000</b>	<b>\$38,000</b>
<b>DESIGNATION TOTAL</b>			<b>\$2.6 million<sup>2</sup></b>	<b>\$96,000</b>
<u>Notes:</u>				
1. Totals have been rounded.				
2. Excludes costs associated with potential changes in some training activities and potential reduction in military readiness.				
<u>Source:</u>				
IEc analysis based on conversations with and public records provided by personnel from U.S. Fish and Wildlife Service, the U.S. Army Reserve, the California Army National Guard, the U.S. Forest Service, California Department of Transportation, and the San Luis Obispo County Department of Planning and Building.				